



BRITISH HONDURAS

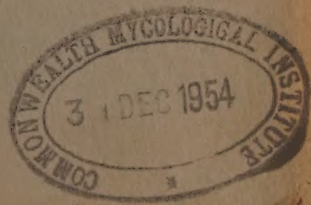
ANNUAL REPORT

OF THE

AGRICULTURE DEPARTMENT

FOR THE YEAR

1953



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Annual Report of the British Honduras Agriculture Department for the Year 1953

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ANNUAL REPORT OF THE AGRICULTURAL DEPARTMENT FOR THE YEAR 1953

PART I—AGRICULTURE IN THE COLONY

INTRODUCTION AND POLICY

1. The year 1953 has been one of particular importance to the agriculture of British Honduras. Whilst agriculture has long been an established and important industry here, it has never before been given the same opportunity fully to utilise the potential which exists, nor the necessary framework of surveys, experiments and staff which are essential to the proving of that potential, and the guidance of future development along sound lines.

2. The implementation of the five year development plans which were prepared and approved in 1952, could not be started until the extra staff had been recruited, but with the majority arriving in the Colony by mid 1953, many schemes are now under way.

3. No sure and prosperous agricultural economy can be developed unless it is based on sound proven principles, and whilst the proving of such principles may sometimes be a comparatively lengthy business, important indications are already resulting from the work which has now been instituted.

4. As this work expands, these results will multiply and be passed on to the farming community through the extension services of the Agricultural Department. It is thus declared departmental policy:—

- (1) to survey and prove the potential;
- (2) to provide adequate trained personnel capable of undertaking the necessary trials and experiments on crops and stock, and thereafter to pass on the results to the farming community; and
- (3) to assist farmers with their production through the encouragement of better and proven techniques.

5. This policy is being implemented both by the provision of local funds, and by a very considerable Colonial Development and Welfare Grant.

6. For the last year and a half a Colony-wide Land Use Survey has been in progress, and this is due for completion in 1954. The Survey is already being followed up with a programme of experimental stock and crop trials, and the overall pattern which agricultural development should follow is becoming clear.

7. Currently further development plans, to carry on the work now in progress and to follow up the results achieved, are being prepared to cover the period ending in 1960.

8. Inevitably a policy of "slow but sure" is a disappointment to many who are ready and enthusiastic for rapid development, but it is of the greatest importance to a small country which wishes to avoid damaging and expensive failures, which can only too easily occur if surveys and pilot schemes are not first undertaken.

9. That there exists a thoroughly worthwhile agricultural potential is beyond question; that it can be developed and encouraged far beyond its present level is also very plain; but it is equally evident that this must be on sound lines and that it will ultimately require a far larger farming community and a more intensive agriculture than are now in being.

10. Nonetheless one can already see in many areas the beginnings of this development taking shape and during the next few years it should become possible to speed up the rate of this progress.

11. Whilst this report for the year 1953 in fact covers only the one season, it is important that it should also be regarded as the curtain raiser to the wider pattern of agricultural development which can follow.

WEATHER CONDITIONS

12. Although conditions varied from district to district, as is clearly indicated in the following paragraphs, 1953 was a dry year. Nevertheless because of reasonable distribution most crops came up to average with citrus having a record year.

13. The dry season itself was severe, being prolonged into early June, with numerous fires occurring in the North and West and on the Mountain and coastal pine ridges.

14. In the North, the rainfall was well below average with both Corozal and Louisville recording only half that measured in 1952.

15. Orange Walk on the other hand with 60.21 inches exceeded the 1951 and 1952 totals of 46.48 and 57.09 inches.

16. Cayo District was also comparatively dry, Cayo Town measuring only 36.95 and Central Farm 42.47 inches compared to 50.95 and 63.01 in 1952.

17. In Belize however, despite two very dry months in April and May, the total of 65.07 was nearly seven inches more than for the previous year.

18. Stann Creek had its fifth lowest total since recordings were started at the Agricultural station in 1932 and the first six months were the driest ever to be measured there, totalling only 10.99 inches compared to 31.93 in 1952.

19. Toledo district also experienced drier conditions and the 116.64 inches recorded at the agricultural station was nearly thirty five inches below the ten year average.

20. At Stann Creek the highest temperature recorded was 98° on May 1st, though unofficial records in the Western district were frequently over 100° during the same month. January was the coolest month with a low of 51° on the eleventh, a mean minimum of 62.1° and a mean maximum of 81°.

21. In Belize the highest temperature recorded was 96° on the 13th June, and the coldest 54° on the eleventh of January as at Stann Creek.

22. A summary of rainfall records from the forty-five reporting stations, together with monthly meteorological data from Stann Creek and Belize is attached as Appendix I.

23. In spite of the generally drier conditions the maize and rice crops were good, citrus, as already mentioned, was a record and the 1953-54 bean crop also promises very well. Crops which were affected adversely however were the 1952-53 bean crop, coconuts and sugar-cane; additionally stock owners who had no pasture reserves again suffered losses during the dry.

IMPORTS AND EXPORTS

24. The quantities and values of agricultural imports and exports for the year are set out in Appendix II; the main variations from 1952 being explained hereunder:—

- (1) The decline in *banana* exports is due to the abandonment by the Colonial Development Corporation of their banana scheme in the Stann Creek Valley.
- (2) The increase in *citrus juice* exports results from the installation of the new concentration plant by the Citrus Company. Exports are expected to continue to increase very considerably as the newly established plantations come in to bearing in the next two years.
- (3) There has also been an increase in the exports of canned grapefruit segments.
- (4) *Sugar* exports continue to rise towards the ultimate objective of a 25,000 ton quota.
- (5) The exports of *Coconuts* (whole nuts) fell as a result of the unfavourable season and the lower prices ruling in overseas markets; this is also reflected in a slight increase in Copra production.
- (6) Some exports of canned *Pineapple* products are now being made, as a result of the increased cultivation of this crop in the Corozal District.

CROPS

CITRUS

25. The Stann Creek Valley continues to be the main producing centre in the Colony and a further 828 acres were planted up with Valencia Oranges in that area during the year. The total acreage now under citrus in the Valley is 3,548 acres of which 726 are in grapefruit (all but 4 in bearing) and 2,813 in Valencia Orange (only 59 in bearing). The Citrus Company have 1,450 acres of oranges and 482 of grapefruit, and the B.H. Fruit Company (C.D.C.) 506 acres of oranges.

26. Cultivation practices continue to improve slowly, with more attention being paid to regular cleaning, and more farmers applying fertiliser as nitrate of soda. Nevertheless little pruning is attempted and some of the smaller farmers still do not plant on mounds.

27. Some of the old grapefruit trees have continued to dieback, for this gummosis is largely responsible; there is no definite evidence to show that Tristeza disease occurs here, and it is to be hoped that it will not do so.

28. It was a record fruit year, and trees throughout the Valley were well laden, including many of the young three-year old oranges at Pomona, which gave crops of three boxes per tree.

The following factory figures over the last three years well illustrate the comparative crop sizes:—

Season	Grapefruit Units						Orange Units
1951—52	..	..	..	253,000	..	..	—
1952—53	..	..	..	150,597	..	..	6,619
1953—54	..	..	..	315,000	..	..	35,000 estimated

Note: A unit of grapefruit is a 70lb. box and of oranges a 90lb. box.

29. The Citrus Company opened their factory early and before sufficient mature grapefruit were available; initially processed fruit received poor quality reports, but later production improved and high quality is now a primary concern of the factory.

By the end of the year the factory had processed 215,859 units of the 1953 - 54 crop including 19,141 of oranges and 89 of lemons.

30. The Citrus Company's record of production and sales during 1953 is as follows:—

	Fresh Fruit (Boxes)	Sections Cartons	A/2 Juice Cartons	A/10 Juice Cartons	404 Juice Cartons	Juice Barrels	Concen- trate Barrels	Hicell Barrels
GRAPEFRUIT—								
<i>Export</i>								
U.K. ..	45,009	136,402	11,400	300	826	1,088	165	19
Local Sale ..	19	96	837	—	—	—	—	—
Lost and Spoilt	96	644	17	10	—	—	5	—
ORANGES—								
<i>Export</i>								
U.K. ..	104	—	9,786	—	—	—	13	—
Local Sale ..	3	—	412	—	—	—	—	—
Lost and Spoilt	—	—	43	—	—	—	—	—

LEMONS Fresh boxes, U.K. export 88, Local Sale 1.

GRAPEFRUIT OIL Lb. U.K. export 3,390, Lost and Spoilt 245.

ORANGE OIL Lb. U.K. export 3,975, Lost and Spoilt 90.

Note: A/2 Juice Carton contains 24x12oz. tins.

A/10 Juice Carton contains 6 tins approx. 1 gallon each.

404 Juice Carton contains 12x24oz. tins.

Barrels contain 43 gallons.

31. The Citrus Company is now encouraging growers to have at least 10% of their total citrus acreage in grapefruit, and some new grapefruit plantings may result, whereas for the last few years the expansion of acreage has been solely in Valencia oranges. The Company chartered shipping to export fresh fruit to the United Kingdom where it was on sale in the autumn prior to the import of the Mediterranean crop.

32. The Agricultural Department sold 7,765 budded plants from the agricultural station, and the Citrus Company made a further 50,000 Valencia Orange plants available to growers from their own nurseries during the year. Supply has now virtually caught up with demand for the first time in many years.

33. There can be no question of doubt that citrus production in the Valley, spurred on by the ten year Ministry of Food contract for orange juice, is now the most intensified and best established agricultural industry in the Colony. It is to be hoped that it can be successfully safeguarded from the dangers which can result from too great a dependence on a one-crop economy. It is also plain that a very considerable labour force will be required in the years ahead to harvest the annual orange crops.

34. In the other districts, citrus production continues to be on a comparatively minor scale, though two private estates in the Belize and Cayo districts have several hundred acres newly planted to oranges. In the northern district also better planting and more budded plants are being used, and in addition to the local fresh fruit export to Chetumal, shipments have been made to the Stann Creek factory.

35. A total of 716 budded plants were sold from the departmental nursery at the Central Farm.

COCONUTS

36. After the improved production of the last few years, the dry season and lower prices for whole nuts resulted in a setback to the industry, and the exports fell from two and a half to one and a half million nuts.

37. Little improvement of cultivation standards is yet evident, and no schemes for rehabilitation or insurance coverage have yet been instituted.

38. A small cooperative Producers' Association has been formed in Corozal and the fifty members exported 82,750 nuts through their Association between October and December. Preliminary discussions concerning the formation of a colony-wide Association were held but no concrete progress has yet been achieved to this end.

39. Copra exports increased from 214,368 to 402,700 lb; being largely sundried, they were of poor quality.

40. There is no doubt that much could be done to improve overall production, but this necessitates far more intensive cultivation than many growers are willing or able to do.

BANANAS AND PLANTAINS

41. The Colonial Development Corporation decided early in the year to abandon their Lacatan production scheme at Alta Vista in the Stann Creek Valley, and to switch over to citrus, where they also included 35 acres of imported Cacao (Trinidad I.C.S. clones) transplanted from Sittee River and planted up through old banana shade.

42. Banana production has therefore reverted to a small farm crop for local markets, as for Plantains. Nevertheless numerous farmers still hope for a revival of the banana trade which virtually ended in 1939; unfortunately both Panama and Cercospora leafspot diseases have to be combatted, and such is far from easy.

43. Plantain production in the Stann Creek area was badly affected by the dry weather, and later wind damage led to local shortages in market supplies. Small farms at both Mullins and Sittee Rivers suffered particularly.

RAMIE/BOEHMERIA NIVEA

44. The Colonial Development Corporation's plantation at Barton Ramie gave disappointing yields, and expert advice was sought by the Corporation concerning the introduction and trial of other varieties; at the end of the year the future development of this project, after the completion of its first three years experimental phase, was still in doubt.

45. Exports of fibre totalled 66,869 lb. compared to the first export made in 1952 of 30,016 lb.

SUGAR

46. At long last the negotiations concerning the expansion of the Corozal Sugar Factory were finalised during the year, and with the approval of an immediate 5,000 ton export quota under the Commonwealth Sugar Agreement, the local production position became much clearer.

47. As a result cane plantings have increased, and the future prosperity of the Northern districts can be greatly enhanced; the factory estimates that it will grind 30,000 tons of cane for the 1954 crop.

48. Production figures for the 1953 crop (February—August) are:—

(1) Total cane ground:—24,672.11 tons, 41.4% of which was supplied by large farmers and 58.6% from small farmers.

(2) Tons of sugar manufactured:—1,009.20 brown, and 802.41 white; 814.80 tons exported.

(3) Output:—9.25 tons of cane per ton sugar at 96 test, and 9.39 by Commercial test: 178,326 gallons molasses made; grinding rate 10.94 tons per hour.

49. There was a bad outbreak of froghopper, *Aeneolamia postica jugata* (Fowler) affecting some 50 acres around Pembroke Hall in September.

50. In the Toledo district six small mills continue to make crude brown sugar which is sold locally.

51. There were 8 distilleries operating during the year, 5 in Corozal, 2 in Orange Walk and 1 in Toledo. The Northern distilleries produced 27,082 liquid gallons rum, equivalent to 41,215 proof gallons.

CACAO

52. The Colonial Development Corporation decided early in the year to transfer their imported planting material from their Sittee River property to Alta Vista, where 35 acres were subsequently established under banana shade. Their operations have therefore been restricted to this small area in the Stann Creek Valley, and no other cacao development has occurred, although prices are very high and possibilities for the production of this crop here could be considerable.

PINEAPPLES

53. Cultivation continues to expand in the Corozal area whence 55 tons were shipped to Belize and Stann Creek for canning; it is estimated that another 50 tons were sold fresh. The average weight of fruit harvested in this area was 2.85 lb., the principal varieties at present being grown are known locally as "sugar loaf" and "horsepine".

54. The Corozal growers registered as a Cooperative group in August and now number 106 members, with a total acreage of 264, of which 60 were planted up in 1953.

55. In other districts production is scattered and less organised, though good fruit can be grown and are sold in local markets. The Citrus Company in Stann Creek processed 24½ tons, mostly from Corozal, making 709 cases of products during the year.

56. Another small canning plant in Belize produced 965 cases of 24 x 20 oz. cans, of which 270 were exported to the United Kingdom and 548 sold locally.

RICE

57. In the Toledo district, apart from bird damage to germinating seed, conditions were favourable for both the B.H. Creole and B.G. 79 varieties, the yields of which were estimated at 1,900 lb. and 1,700 lb. per acre. The total acreage in this district was estimated at 1,150 acres.

58. Seed of British Guiana varieties D54-42 and D.110 was issued to ten selected farmers by the Department, but these varieties were reported to have lodged heavily and therefore spoilt before they could be threshed.

59. Three private individuals purchased about half the crop in the area to supply their own small mills and the Marketing Board's purchases were consequently greatly reduced, totalling only 521,404 lb. compared to 820,251 lb. in 1952. Purchases from Barranco were badly adulterated with red rice.

60. The detailed area purchases by the Board in this district for 1952 and 1953 were as follows:—

	1952	1953
	lb.	lb.
Monkey River	43,333	44,582
Barranco	47,941	56,388
San Antonio	81,000	12,589
San Pedro Columbia	124,000	113,896
"The Dump" }		156,815
Toledo Settlement }	523,977	110,876
Punta Gorda }		26,258

61. Marketing Board loans totalled \$2,805 to 47 farmers, and \$1,998.97 of outstanding loans were repaid.

62. In Corozal and Orange Walk districts acreages were estimated at 475 and 275 respectively and yields at 1,500 - 1,600 lb. padi per acre. In Stann Creek district the estimates were 92 acres with yields of about 700 lb. per acre, all the rice being utilised locally.

63. Production in the Cayo district was very limited, but in Belize district the area was estimated to be 600 acres with an average yield of 700 lb.

64. The Marketing Board's figures for rice imports and local purchases are as follows:—

	1951—52	1952—53	1953—54
	(1st July to 30th June)		
Local purchases	—	423.60	284.33 short tons
Imports	708	1,262	" "
	\$266,049	\$317,543	value B.H. \$

Guaranteed purchase prices were:—\$5.50 per 100 lb. at 13 - 15 % moisture; \$4.90 at 15 - 17 %, \$4.30 at 17 - 18 % and \$3.00 at 18 % plus.

65. It proved impossible to recruit the Rice Specialist provided for in the Development Plan; however Mr. R. H. Wyche, Rice Agronomist, Food and Agriculture Organisation of the United Nations, who was working in Jamaica, paid the Colony a two weeks advisory visit during November, and in his report endorsed the proposals already put forward by Messrs Gadd and Lacey. Subsequently Mr. Wyche has been assisting with recruitment and it is hoped that the post of Rice Officer will shortly be filled and that production development schemes will thereafter be implemented to make the Colony at least self sufficient in the next few years.

66. It is of interest to record that on small pine ridge plot trials at Hector Creek near Belize, where a private individual had unsuccessfully attempted large scale rice cultivation three years ago, the Agricultural Department this year attained yields equivalent to over 2,000 lb./acre, as a result of fertilising with phosphate and lime.

MAIZE

67. Crops in the Northern Districts were average, with an acreage estimated at 12,500. Sample yield figures were taken by measuring one-tenth acre plots and weighing the cobs harvested therefrom; these gave 2,570 lb./acre in Corozal and 3,130 lb./acre in Orange Walk.

68. In Toledo the acreage was estimated at 3,000, two-thirds of which was in the San Antonio and San Miguel village areas alone. Weevil infestation was reported to be high in the field, but nonetheless good yields of 1,300 lb. to the acre were obtained. The Marketing Board purchased 84,053 lb. of maize from this district during the year, 80 % of it coming from San Miguel.

69. 481,450 lb. of maize was purchased for the Marketing Board in the Cayo district during the year; in Stann Creek the acreage was estimated at 155 and yields 890 lb. per acre the Belize acreage was estimated at 2,000 and yields at 1,000 lb.

70. The Marketing Board purchases and exports were as follows:—

					1952—53	1953—54
Purchases	..	..	..	..	1,230.41	1,108.31 short tons
Exports	..	..	..	..	1,416	878 short tons

The Board's guaranteed price was \$3.25 per 100 lb.

BEANS

71. The production of Red Kidney beans has continued to expand each year, primarily because of the encouragement provided by the Marketing Board's guaranteed price of \$18 per 100 lb., and the supplies of seed imported from the U.S.A. by the Board for sale to farmers.

72. Notwithstanding the unfavourably dry conditions which badly affected the 1952 - 53 crop and resulted in low yields, plantings for the 1953 - 54 crop were considerably increased and with very favourable weather a record crop estimated at over 500,000 lb. is in prospect.

73. In a good season therefore, self sufficiency in the Colony is almost in sight after only a few season's encouragement, which is no mean achievement.

74. Yields have hitherto been about 400 - 500 lb. per acre, and these figures were typical of the 1952 - 53 crop; for the 1953 - 54 crop however yields are far higher and that of 1,185 lb. measured at the Central Farm is by no means exceptional.

75. Whilst on the evidence to date it is apparent that bumper crops may be obtainable only once in three or four years, it is also plain that it is this crop, rather than the corn crop which it follows, which will be most paying to the farmer.

76. The main producing areas are in the Indian areas of the Toledo district and the Cayo and Belize districts.

77. The Marketing Board imported and sold seed as follows:—

1952 - 53	..	..	..	..	60,000 lb.
1953 - 54	..	..	..	..	80,000 lb.

Their purchases for the two seasons have been:—

1952 - 53	..	..	..	..	77.08 short tons
1953 - 54	..	..	..	..	335.00 short tons
					(to 1st May, 1954; purchasing unfinished).

78. Other bean varieties including Black Eye Peas are also grown particularly in the Northern districts, but there is little local demand for any surplus and sales to Jamaica have not been easy.

ROOT CROPS

79. Apart from Cassava which is of particular importance to the Carib population of Stann Creek and Punta Gorda, root crops are of comparatively minor importance, although the local market demand for yams and sweet potatoes usually exceeds the supply.

VEGETABLES

80. Production and marketing of locally produced vegetables continue to be far from satisfactory. Several farmers in each district produce good quality cabbages, tomatoes, and beans but their production tends to be fitful and no organised marketing scheme has yet been attempted.

81. A growers cooperative started in the Belize area last year has made little progress; and it is to be regretted that more has not yet been possible to put this industry on a sounder footing; much must depend ultimately on the growers themselves working together to even out fluctuations in production.

MINOR FRUITS

82. As with root crops, avacadoes, mangoes, limes and pawpaw all help to add to the income of small farmers particularly in the Stann Creek, Belize and Northern areas. A few also produce a little crude coffee for local sale, but apart from market supplies, all these commodities continue to be of relatively minor importance.

83. In the Northern districts the avocado crop was a good one, and far less damage from scale insects was reported than in 1952.

LIVESTOCK

84. *Cattle*. It is fair to say that improvements in animal husbandry, particularly with cattle, are becoming apparent; much remains to be done, but at least producers are trying to improve, are adopting better methods, and are showing greater interest in the possibilities.

85. Several of the larger cattle owners have imported better breeding stock, with emphasis on Brahmin type bulls; though of one consignment from the Southern U.S.A. three were lost subsequently from Texas fever; this is a recurrent danger for similar introductions made with stock from areas where tick fever resistance has not necessarily already been built up.

86. More farmers are now establishing planted forage grasses as reserves of fodder for the dry season, and though there were still many losses early in the year, these were not as severe overall as in previous seasons.

87. The Department has been carrying out a tick spraying demonstration campaign in the Western district and also encouraging fodder grass planting by distribution of material; both these measures are having good effects.

88. The Department has also sponsored the formation of the British Honduras Livestock Cooperative, Ltd., which was registered in August with its headquarters in Cayo. The Association now also includes members living in other districts. This also is helping to stimulate interest in better livestock management and the Association is, amongst other things, selling to its members simple knapsack sprayers at cheap rates.

89. Meetings were held in Belize to try and instigate the formation of a Butchers' Association, but no success has yet resulted. The weights of the cattle slaughtered in Belize are still ridiculously small because too many butchers compete and cold storage facilities have been inadequate. Until these problem have been resolved, together with the introduction of grade prices, producers have little incentive to improve their standards of quality.

90. At the request of the Livestock Association a survey of the fresh milk potential in the Cayo district was made, which reveals that an immediate 400 gallons could be available daily, rising to 1,000 gallons in 18 months to two years time. A scheme for supplying fresh milk to Belize is therefore under consideration.

91. At the present two producers, one near Cayo and another near Belize, are selling retail some 2,500 quarts per month in Belize at 30¢ per quart.

92. Another factor having an important effect on the improvement of livestock husbandry is the land clearing unit which commenced operations in the Cayo district in August, and farmers are now establishing pastures of better grasses such as Guinea Grass (*Panicum maximum*) and "Jaragua" (*Hyparrhenia rufa*) on the land cleared by the Unit.

93. The Scatter plot trials have also included grasses, and those established on the "pine ridge" at Hector Creek, some 16 miles from Belize, have shown that better herbage can be grown if phosphate fertilisers are used. Further experiments are of course necessary, but the possibilities that these large areas might be economically and practically improved for cattle are interesting.

94. Controls on the slaughter of female cattle were continued, permits being issued by the Department only for stock which were to be culled as unthrifty, poor breeders or aged. The total number of cows and heifers slaughtered in the districts were:—

Cayo	Belize	Orange Walk	Stann Creek	Toledo	Corozal	Total
33	954	22	44	10	8	1,081
				c.f. (1952)		641

This represented 33.2% of the total recorded slaughterings compared to the 50.7% in 1951 prior to the institution of controls, 39% at the end of 1951, and 20.8% for 1952. However even with the control in force some 264 more head were slaughtered than were apparently covered by permits, i.e. 24.3%.

95. The average Belize slaughter-house carcase weights were 227 lb., compared to 241 lb. in 1952, and for the Colony 216 lb. compared to 234. Full details of Colony slaughter-houses are given in Appendix III.

96. No animals were imported for slaughter during the year, permission being refused for import from the Peten area of Guatemala, owing to there being sufficient animals available locally. These animals were subsequently transported through the Colony by road to Chetumal in Mexico.

97. The Veterinary Officer reported one case of Bovine Coccidiosis in Toledo district and Texas fever with three fatalities amongst imported bulls in the Cayo district. One case of Bovine tuberculosis was also notified at the Belize Slaughter house in January.

98. The Veterinary Officer served as a member of a Committee appointed to report on Belize meat prices and controls.

99. In general therefore, the year has been one of slow but encouraging improvement in cattle husbandry; nevertheless whilst there is a tremendous amount to be done before a real industry can be considered to have been established, the beginnings are becoming far more possible than they were only a short while ago.

100. *Pigs.* The Indian communities of the Toledo district continue to be the most important producers of pigs, despite the fact that they often feed a greater value of corn than the pigs are ultimately worth, and that the free range system around the villages has driven them to grow their arable crops even further away.

101. In San Antonio a cooperative piggery enterprise, including a communally grown fodder area and piggeries, continues to progress well; and the San Miguel village have attempted a communal fencing enterprise. At Crique Sarco it is planned to restrict stock to one side of the river, and arable farming to the other, with a gradual encouragement of pastures and cattle.

102. Shipments to Belize were as follows:—

Criue Sarco area	..	..	..	795
San Miguel	..	..	..	136
Barranco	..	..	..	6
San Antonio	..	..	..	1,453
Total	..	..	..	2,390

Local slaughtering at Punta Gorda totalled 219 head, averaging 57 lb. carcase weight.

103. Slaughterings in Stann Creek totalled 278 head averaging 78 lb.; 374 head were slaughtered in Orange Walk and 342 in Corozal with average weights of 55 and 50 lb. respectively (estimated). Belize slaughterings totalled 5,920 head averaging 53 lb.

104. It is of interest to record that with the bulk of Belize supplies being shipped from Toledo, the producers cooperative there have found that they are losing considerably in weights as a result of the confinement and lack of feed and water en route; they are therefore setting up a holding and fattening unit at the Belize end for use before sale to the butcher.

105. Swine Fever was diagnosed in July by the Agricultural Officer Northern Districts at Patchakan, where 250 hogs out of 300 died. As there was then no Veterinary Officer in the Colony, the Jamaica Agricultural Department kindly cooperated and sent Dr. McDonough over for one week and he confirmed this diagnosis.

106. The Orange Walk and Corozal districts were quarantined under the Swine Fever (infected places) order 1953 S.I. No. 44 of 1953; a vaccination campaign was carried out and by the end of December 3,896 head had been vaccinated; this covered the three outbreak centres of Patchakan, Louisville and Corozal and also the suspect areas from the New River boundary north.

107. Unfortunately complete cooperation from all stock owners was not obtained, the final coverage being estimated at 80%.

108. It is not known whence the outbreak originated, but it is possible that it may have been connected with losses rumoured to have occurred north of the Rio Hondo.

109. The quarantine area was kept in force to the end of the year because of the possibility of fresh outbreaks being transmitted by young and unvaccinated stock, and through the local fauna. Subsequently there have been small flare ups, which unfortunately illustrate that the disease is still with us, and emphasise the need for repeated vigilance.

110. One carcase of pork was condemned in January for Swine Erisypelas.

111. Action was taken during the year in conformity with the other B.W.I. territories to restrict by permit the imports of pork products emanating from the U.S.A. because of the outbreak of Vesicular exanthema in that country.

112. *Sheep and Goats.* No important developments occurred in sheep and goat raising during the year; they continue to be of comparatively minor importance and only 237 and 17 head were respectively slaughtered.

113. *Poultry.* Standards remain generally poor, and Fowl Botulism recurs endemically in Orange Walk and Corozal districts; Fowl Cholera was diagnosed in Belize in December. A total of 3,330 day olds were imported from the United States by various breeders during the year.

114. The table in Appendix IV, lists livestock imports during the year.

MARKETING AND AGRICULTURAL LOANS

115. The Board issued loans to farmers for rice, and corn as follows:—

District	No. of farmers	Acreage		\$
		Rice	Corn	
Toledo	165	486	121	3,748.08
Cayo	266	1	600	1,302.00
Belize	53	114	12½	3,860.50
Orange Walk	223	36½	1,239	2,695.50
Corozal	80	68	354	444.60
<i>Totals</i>	787	705½	2,326½	12,050.68

\$7,206.83 worth of Red Kidney Bean seeds were also issued on a repayment basis to farmers.

116. As already indicated, the Board offered guaranteed prices for rice, corn and beans as follows:—

Rice (padi)	—	—	\$5.50 per 100 lb. at 13 - 15% moisture
			4.90 per 100 lb. at 15 - 17% moisture
			4.30 per 100 lb. at 17 - 18% moisture
			3.00 per 100 lb. at 18% plus
Maize (shelled)	..		3.25 per 100 lb. (Belize)
R.K. Beans (shelled)			18.00 per 100 lb. (Belize).

117. During 1953 the Board milled 812,703 lb. of local padi with an output of 454,723 lb. clean rice (56%). The new vertical column type drier installed at Belize has already given useful service, but the two sack driers erected at Punta Gorda and the Dump have yet to be put into full operation.

118. 878 short tons of surplus maize were exported by the Board to Jamaica.

119. Loans issued from the C.D. & W. Agricultural Credits Fund operated by a Committee and subject to the final approval of the Marketing Board, have been made to 94 farmers up to April 1954, totalling \$171,009; of this sum \$120,695 has actually been issued and \$9,973 capital and \$5,541 interest repaid.

120. The majority of the loans are for periods of three to five years, and have only been running for one to two years to date, so that except for interest repayments, the full effects of this Scheme cannot yet be assessed. It is unfortunate that, because the funds available are limited, the periods for which loans can be granted have had to be restricted to a general maximum of five years, as this does, to a certain extent, hamper those undertaking development with long term crops such as citrus and pastures.

121. In many instances also, particularly for the smaller farmers, adequate collateral credit is lacking, and the plans submitted by such applicants for loans are unsound in that they cannot, perforce, because of their smallness, achieve the real major development which could enable the applicants to become more independent.

122. Once the pattern for sound agricultural development has been proven however, there will, and must inevitably, be a very strong necessity for subsidy schemes to help such people, and this will also be the easier through well established cooperative groups if they can be set up. There will too be a pressing need for an independent agricultural loans bank, with a wider scope than is now available from the present fund.

123. The Director served both as a member of the Board and as a member of the Agricultural Credits Fund Committee. Once again the staff of the Department assisted the Board with crop and agricultural credit fund loan inspections, crop purchasing and loan repayments. The long hoped for release from the loan collection and crop purchasing work is now potentially nearer; whilst it has had to be continued the Farm Demonstrator has had difficulty in attempting to be both the farmer's friend and his debt collector.

COOPERATIVE PRODUCER ASSOCIATIONS

124. Whilst a number of cooperative producer associations have been set up over the last two years, including groups of livestock owners, coconut, rice, citrus, vegetable and sugar growers, these associations have still a long way to go before they can stand four-square and play their full and essential part in assisting local agriculture. Their establishment is a most welcome and encouraging development, proving as it does, that groups can work together and discard any innate distrust of individuals which therefore militates against progress. Too often it has been said that such movements have been tried in the past and failed, and therefore are not worth trying again; yet their development and spread is basically essential now more than it ever was, and their members must quickly learn to shoulder responsibility and to push forward for sound economic goals. For the present they are delicate flowers, which need nurturing by all in a position to help with considerable attention and finesse.

YOUNG FARMERS CLUBS

125. In the Corozal district, the Senior Farm Demonstrator has been active in encouraging three Young Farmers Clubs, which have held regular meetings and field days and are actively engaged in a number of community projects, including rice and corn growing, and pineapple production. In addition some of the Department's scatter plot trials have been laid down on the farms of cooperating members.

This is another encouraging development, which, it is hoped can be emulated in other areas.

CORONATION FARM COMPETITION

126. A Colony-wide farm competition was organised in celebration of Coronation Year, the objective being to encourage good land use and better farming methods, rather than actual

prize produce. Entrants were limited to those having farms of less than 100 acres, and the Colony was divided into twenty three separate areas, for which prizes were awarded as well as three additional Colony prizes. Judging took place in stages from July onwards with the final district assessments being made in November.

Prizes were awarded at \$100 each, and \$300, \$200 and \$100 extra for the major placings with two extra highly commended of \$25 each. Certificates, medals and plaques were also awarded to winners. The three Colony prize winners were:—

1st	..	..	..	R. E. Belisle, Stann Creek.
2nd	..	..	..	Victoriano Pope, Dolores, Toledo.
3rd	..	..	..	Philip Bent, Tower Hill, Orange Walk.

127. The competition certainly stimulated interest, and very praiseworthy efforts were made by all entrants.

128. During the actual Coronation programme in Belize, the Department's stall at the two-day fair held at the Barracks, included stock and crop exhibits.

LAND CLEARING AND PLOUGHING

129. A Land Clearing Engineer having been recruited locally, and the preliminary training and testing of drivers and equipment being completed, work started on private lands on an experimental basis for C.D. & W. Scheme D.1868 of the Development Plan, Part II, in August. By the end of the year 273 acres had been bushed and windrowed, and 282 acres heavy and 255 light harrowed for five individuals in the Cayo District. The land so cleared is being put into pasture or citrus through annual crops of corn and beans.

130. There is no doubt that this scheme is already making a valuable contribution to agricultural development, and there are numerous advance bookings now on hand for land clearing by the two D.8 and two D.4 tractors which comprise the main unit equipment. The scheme is reported on more fully in Part II.

131. The tractor obtained in 1952 for hire to small farmers for ploughing of lands in the Stann Creek valley was operated up to the end of June. A total of 298 hours work, was made up of $138\frac{1}{2}$ hours ploughing, $69\frac{1}{4}$ hours harrowing and $90\frac{1}{4}$ hours travelling. Work was done for 62 farmers on a total acreage of $49\frac{5}{8}$ acres.

132. Payment was insisted upon before work started, owing to the failure to pay of $\frac{1}{3}$ rd of those for whom work was done in the previous year. Charges were at \$2 per running hour, which realised \$415.63, against expenditure and depreciation of \$762.88.

133. The same difficulties were again experienced as in 1952, in that the areas offered were invariably too small and insufficiently cleared for efficient operation to be possible. Whilst in the Carib Reserve area, the farms are in any event small, the present system of cultivation itself makes mechanisation virtually impossible. Farmers grow small areas of cassava for their own use, with mango and coconut trees scattered indiscriminately through the area; the major part of their small plots remains in bush fallow. Even so hand cultivation by hired labour is expensive and farmers hopefully expect to be able to hire a tractor even at comparatively absurd costs.

134. Nevertheless, it is now policy only to plough on areas which are correctly cleared and are of reasonable size.

135. A small amount of work was also done in the Cayo district on a hire basis for private farmers, but here again the lesson has still to be learnt, that there are essential preliminary standards of clearing necessary before expensive equipment can be utilised.

PART II—WORK OF THE DEPARTMENT OF AGRICULTURE

STAFF

136. There was a welcome influx of new staff largely recruited under the various Colonial Development and Welfare Schemes during the year; they included a third Agricultural Officer, a Development Officer, an Agricultural Education Officer, a Tobacco Officer, an Experimental Officer and a Land Clearing Engineer. Additionally eight temporary Farm Demonstrators have been added to the strength and two probationers discharged.

137. Dr. P. G. Everett, Veterinary Officer was invalided on the expiration of his contract, leaving for Canada on the 15th April and Dr. F. Manolson was recruited to replace him, arriving in the Colony on the 12th October.

138. Mr. D. D. Haynes, Agricultural Instructor, proceeded on retirement leave on the 1st January after 18½ years service.

139. Mr. F. F. Orio was promoted Assistant Agricultural Officer from 1st January, and Mr. I. S. Stephenson, Farm Demonstrator Grade I; Mr. F. Bautista was promoted Farm Demonstrator Grade II.

140. Mr. E. G. Russell, Temporary Agricultural Instructor, left for a three years degree course at the University of British Columbia in August.

141. Messrs. J. A. Swasey, T. Ramos and L. V. Gabourel, Farm Demonstrators spent 6 months in Jamaica attached to the Agricultural Department there on training courses financed by the W.I. Training Scheme funds (C.D. & W.).

142. The Director acted as Development Commissioner from June until he went on U.K. leave on the 10th August; Mr. G. B. Gregory, Senior Agricultural Officer, acted as Director in his absence.

143. The full departmental staff list is set out in Appendix V.

STAFF COURSE

144. A fourth Departmental Staff course was held from the 21st - 24th July, and was opened by His Excellency the Governor in Belize. In addition to general discussions, talks were given by the Directors of Survey and Medical Services, and the Conservator of Forests, and excursions made to the Central Farm and the Stann Creek Valley. The opportunity was also again taken to hold a valuable discussion with the Chairman and Secretary of the Marketing Board.

OVERSEAS TRAINING COURSES

145. For the first time funds were made available from the W.I. Training Scheme (C.D. & W.) to send three Farm Demonstrators to Jamaica for a six months attachment course to the Agricultural Department. Mr. J. A. Swasey, Farm Demonstrator I, being posted to Hope, Caenwood and Orange River for Cacao work; Mr. T. Ramos, Temporary Farm Demonstrator was at Orange River, Drax Hall, and in St. Thomas learning coconut work and Mr. L. V. Gabourel, Temporary Farm Demonstrator at Hope, Bodles and Grove Place on live-stock.

146. All three benefitted very considerably from their courses, and our thanks are due to the Jamaica Department, in particular, to the C.D. & W. organisation and to all those others who helped to make this experiment so successful.

147. As a result application is being made for others to follow in 1954 for courses on rice and general extension work; and our lead has now been copied by other W.I. Territories, who are also sending men to Jamaica for similar courses.

148. The Director, whilst on U.K. leave, attended a three weeks course on Grain storage and rodent control organised through the Colonial Liaison Officer to the Pest Infestation Laboratories of the Department of Scientific and Industrial Research.

AGRICULTURAL EDUCATION

149. Mr. C. A. S. Hynam was appointed Agricultural Education Officer and arrived on transfer from Trinidad on 22nd June. His first four months were spent in touring the Colony, in discussions with Agricultural and Educational staff and in drawing up proposals for future courses.

150. On the 22nd October the new training Hostel, just completed at the Central Farm, was opened by His Excellency the Governor.

151. The Hostel contains accommodation for 12 students and separate accommodation can be provided for women teachers attending mixed courses. There is a lecture—recreation room and library, communal dining room and kitchen.

152. The students organise their own catering and look after grounds and buildings whilst on course and with a cook-caretaker's assistance.

153. The funds for the buildings, subsistence and training of students, and the Agricultural Education Officer's emoluments are all provided under C.D. & W. Scheme D.1808.

154. The first course commenced on October 27th and closed on December 21st. It included seven men, aged 21 to 25, and one aged 46; two were Spanish, three Carib, one Kekchi, one Mayan and one Creole. One had been a probationary Farm Demonstrator since March and two others were Farm Demonstrators of longer standing. Two of the trainees had had secondary school education, the rest only primary.

155. The course was deliberately kept simple and included practical work on the Central Farm; lectures were given by the Veterinary, Experimental and Agricultural Education Officers and a number of guest Speakers also contributed. Tests were set at the end of the course, and the Mobile Cinema Unit from the Public Relations Office was made available on two occasions for showing of agricultural films.

156. Whilst the main emphasis of these courses is agricultural, they are at present designed to cover elementary principles, and to broaden the general outlook of those attending, rather than attempt more ambitious work. That this policy is the correct one, was amply justified from the results of this first course, which is to be followed by a second to include the majority of the junior staff of the Department. It is also hoped to run a separate short course for school teachers during 1954.

157. On the conclusion of the Course, three of the unemployed trainees were selected for probationary appointment as Farm Demonstrators.

EXTENSION WORK

158. District staff were again engaged on a multiplicity of duties, including the inspection of lands for Location Ticket grants, for Agricultural Credit Fund and Marketing Board loans; in purchasing crops for the Marketing Board and seed supplies; in the Coronation Farm Competition inspections and surveys.

Some also assisted with simple stock hygiene, the Swine Fever inoculation campaign in the Northern Districts and castration of boars. In the Cayo district, in particular, the staff carried out demonstrations of spraying against ticks and encouraged the planting up of better fodder grasses. In Cayo and Stann Creek they supervised tractor ploughing for small farmers, and in Toledo encouraged the use of hoes and sickles. Group farming was encouraged, and the Young Farmers Clubs, Rice and Coconut growers of Corozal given assistance. In all areas staff advised and demonstrated with citrus nurseries and 'Wee Wee' ant control; they also helped the Experimental Officer with the Scatter plot programme.

159. One hundred and ninety seven location ticket inspections were carried out during the year of which 56 in Belize, 10 in Stann Creek, 6 in Toledo and 6 in Cayo districts were recommended for grant of Title, (28½%); 45 in Belize, 52 in Stann Creek, 16 in Toledo and 6 in Cayo were recommended either for extension of time and re-inspection or for cancellation.

160. Some Demonstrators have also made creditable efforts to practice what they preach in their own compounds, and hold demonstrations and discussions there, which all help to disseminate knowledge.

161. Regular District staff meetings are now becoming routine.

DISTRICT AGRICULTURAL STATIONS

162. With three Agricultural Officers stationed at District Farm centres it became possible to proceed more rapidly with C.D. & W. Scheme D.1824, the renovation of these agricultural stations, for plant multiplication, simple trials and demonstrations and as stud centres.

163. At *Orange Walk* staff houses, equipment sheds and stock pens were being completed, and a start made on the small farm area itself, which will be largely utilised for stock fodder.

164. At *Stann Creek* apart from dairy and pig buildings which will be completed in 1954, the work on the other buildings started last year was finished and the farm generally cleared of an accumulation of rubbish and old trees.

165. The small herd of seven cows serviced by a Devon type bull, dropped six calves and milking has again been instituted, with local sales at 10¢ per quart of 210 quarts.

166. The main work continued to be in citrus propagation, with 7,765 plants being sold, with some 38,000 in preparation for supply in 1954. 203 grafted mango were also distributed, with a small number of rambutan, velvet apple and akee.

167. Part of the farm was utilised for fodder (elephant and Guatemala grasses), and minor crops such as black eye peas, groundnuts, sweet potatoes, yams and cocos; a small area was also planted in cacao. The pasture area was thoroughly cleared and fenced and shows considerable improvement.

168. The Water supply has also been completely renovated and a new pump installed, resulting in an adequate and reliable supply at all times.

169. At *Punta Gorda* renovation of buildings and the farm continues; new pastures have been established and fenced and small trials or plots of local crops laid down.

170. Observation plots of sweet potato varieties gave the following yields:—

	lb. per acre
Black Rock	1,965 (ex Barbados)
Red Nut	19,054 (Local)
B44	7,258 (ex Barbados)
B5	8,166 (ex Barbados)
John Directly	2,722 (Local).

171. Rice variety trials gave most disappointing yields, probably because the land has for too long been cropped in rice. This area will be fallowed and new ground utilised in the future.

BAKING POT CENTRAL FARM

172. (a) *Buildings*. New houses were completed for the Experimental Officer, Foreman Mechanic, Livestock Assistant and a departmental Rest House. Eighteen labourers houses were built along the Listowel Road, and the Hostel and caretaker's house erected near the garden. A new Store and an Extension to the drying floor behind the office were also finished.

173. Another new house for the Livestock Officer, in exchange for his—to be released to the Agricultural Education Officer—has been commenced; and temporary garage and store provided for the Land Clearing Unit.

174. Nevertheless, with an expanding staff, office, store and garage facilities continue to be cramped, and clerical staff are having perforce to share housing.

175. C.D. & W. Schemes for an Electricity and Water supply for the station have now been finally approved and work will very shortly be commenced on the installation of both.

176. (b) *Rainfall* records since the station was started are set out below:—

	1949	1950	1951	1952	1953
January	2.90	6.77	1.57	2.45	0.19
February	0.44	2.01	2.74	0.63	1.01
March	0.96	1.49	1.11	0.20	0.40
April	0.13	0.47	2.25	2.73	0.02
May	0.00	0.99	2.33	4.28	8.27
June	3.32	10.06	5.51	9.47	2.56
July	1.21	4.98	10.60	9.48	4.95
August	2.35	5.78	3.25	5.26	4.82
September	4.21	4.80	6.25	5.81	8.09
October	2.03	8.92	8.78	13.23	5.39
November	1.96	2.30	5.57	6.74	3.72
December	5.58	1.60	6.88	2.71	3.05
<i>Total</i>	25.09	50.17	56.84	62.99	42.47

177. (c) *Crops*. No further extensions were made to the arable acreage this year although the 10 acre strip to the North of the road was finally cleared, the main new developments being confined to the Livestock section.

178. *Maize*. 62 acres planted in May/June suffered from drought and then severely from wind damage, so that the harvest was an extremely poor one, although the new mechanical corn picker was tried out and worked well except where weeds were heavy and caused stoppages.

179. *Red Kidney Beans*. The 1952/53 crop on 31 acres also suffered from the early onset of the dry season and the yield averaged only 241 lb. per acre. This crop had been planted late, in December, and was not manured. The 1953/54 crop, 64 acres, was planted earlier, in November, and given a 75 lb. p.a. mixture of equal parts superphosphate and sulphate of ammonia. Planting was at 18 in. x 18 in.; this was done mechanically at a seed rate of 40 lb. per acre, and a tractor rate of 1 acre per hour round the clock, the whole being completed in 5 days. In contrast to the previous crop, growing conditions were very favourable throughout and this acreage subsequently averaged a yield of 1,185 lb. and a total revenue of \$12,423 was realised from its sale.

180. *Yams*. A variety trial gave yields as follows:—

Variety	Yield Tons per acre staked	unstaked	c.f. 1952 yields unstaked
Carib	19.30	11.55	11
Chinese	6.83	—	5.4
White	10.98	—	10
Yellow	6.28	—	4.4

181. *Sweet Potato* variety and time of reaping trials resulted:—

Variety	Yield in lb. per acre Reaped at:—			
	3½ months	4½ months	5½ months	6½ months
Red Nut	2,868	8,010	13,037	17,143
B5	2,570	12,741	9,408	15,348
Black Rock	2,184	4,959	8,198	15,348
Flog All	1,764	2,486	8,938	10,846
John Directly	453	3,723	7,056	5,201
B44	353	1,330	5,242	8,400
Local Red	185	1,747	5,309	19,620

(a) Red nut has shown itself to be a consistently high yielder, irrespective of time of harvesting, to be free of worm damage, and of a good shape.

(b) The varieties Black Rock and B5 introduced from Barbados were reported to have the best eating quality.

(c) Local Red, Flogall and John Directly were very variable in shape and size.

(d) There was a high percentage of split tubers, which may indicate that the clay soil is not really most suitable for sweet potatoes.

(e) Local Red produced most leaf and could be suitable as pig forage.

182. *Cassava*. Blue Beef variety averaged 6 lb. per hill in yield; and 39 lb. starch was made from 630 lb. roots in an experiment with a bitter variety.

183. *Groundnuts*. A variety trial planted in September and harvested in January 1954 gave yields:—

Variety						Yield unshelled lb./acre
Valencia	..	..	..	..	..	500
Spanish 205	..	..	..	..	..	470
Tennessee Red	..	..	..	..	..	800
Empire Bright	..	..	..	..	..	440
M.P.C.	..	..	..	..	..	400
Natal Common	..	..	..	..	..	519
"Bagwariya"	..	..	..	..	..	1,997
MG 383	..	..	..	..	..	1,144
MG 372	..	..	..	..	..	660
MD 351	..	..	..	..	..	325
MJ 371	..	..	..	..	..	340
"Yipa"	..	..	..	..	..	460
Kano 38	..	..	..	..	..	520

184. *Pineapples*. An area containing 890 "Sugarloaf" 2 ft. apart in double rows x 6 ft. and dressed with Superphosphate at 224 lb. per acre gave 338 fruit averaging 3 lb. each. 7 "Smooth Cayenne" plants produced 6 fruit averaging nearly 4 lb. each.

185. The vegetable garden, introductions section and citrus nursery were continued and expanded; 716 budded citrus plants were sold, and the new nurseries prepared to supply all orders, totalling 4,279 plants, in 1954.

186. (d) *Livestock*. (i) *Pastures*. Clearing for pastures was extended and a further 197 acres is now in various stages of development, making 275 in all. Opportunity was taken to utilise the Land Clearing Equipment to assist during their working up trials in July and August. *Hyparrhenia rufa* ("Jaragua") was sown on 6 acres near the site for the new dairy buildings, but seed of *Panicum maximum*, (Guinea Grass), sown on 10 acres failed to germinate. 41 acres, cleared and fenced, are regenerating well in 'natural' pasture of Bermuda grass and crabgrass. An area set aside for feeding stuffs was planted with Plantains and Cocos for pig feed. Additionally various introduced grasses and legumes were established in observation plots which could later be utilised for palatability trials. Of these *Stenotaphrum secundatum*, *Digitaria decumbens*, *Ixophorus unisetus* and *Melinis minutiflora* did well.

187. A serious fire, resulting from clearing operations during the very dry spell in April, spread through the Guinea Grass area, but whilst considerable effort was required to control it, it actually helped towards clearing further areas for pasture rather than causing damage.

188. All main fence lines were maintained in repair and a further 575 chains of new fencing erected. The pasture area is now virtually divided into two main halves, with 7 paddocks on the eastern side, and on the west a guinea grass area, at present controlled with electric fencing, and 8 small bull pens inside a larger enclave, totalling 110 acres, for which clearing and establishment of pasture have yet to be completed. An area to the West has also been fenced off and handed over to the Listowel Boys Training school. *Glyricidia maculata* was planted up along fence lines as a live post, in addition to the 3,045 sawn and treated pine. 70% of the 600 planted have taken; 43 wooden gates were made and hung.

189. (ii) *Cattle*. The herd was augmented during the year by importations of foundation stock from Jamaica; one Red poll x Zebu bull was imported in February, and another in December for district stud, together with 2 Jersey x Zebu, and 8 Red Poll x Zebu heifers for the foundation herds; a Brahmin bull was also imported with this consignment.

190. There were 21 births all from the Grade Jersey imported in 1951, 9 bulls and 12 heifers, from 33 services; there were 2 deaths amongst these calves and four other animals were sold as culls.

191. Now that the area is largely fenced, the herds can be divided into beef and dairy units, and early opportunity will be taken to cull severely to the basic foundation stock for grading up.

192. The state of the herds is given in the following table, which shows a total of 109 head at the end of the year:—

		At 1.1.53	Births	Pur- chases	Trans- fers	Deaths	Sales	Trans- fers	At 31.12.53
Bulls		2	—	4	2	—	1	—	7
Cows		29	—	—	2	—	1	—	30
Heifers		23	—	10	7	—	—	2	38
Bull Calves		2	9	—	—	—	—	4	7
Heifer Calves		7	12	—	—	1	—	7	11
Steers		17	—	—	2	1	2	—	16
Total		80	21	14	13	2	4	13	109

All stock came through in good condition, with spraying and dressing being carried out as regular routine.

193. The 67 head of stock which had been given temporary pasturage for the C.D.C. were handed over to a private purchaser in August.

194. (iii) *Other stock.* No progress has yet been possible with the establishment of the pig and poultry units which are included in the plans for this scheme.

SCATTER PLOT TRIALS

195. The Experimental Officer arrived in the Colony in June and took over the supervision of the scattered trials already started by the Land Use Survey personnel and District staff. The programme was expanded to include varietal, herbicide and uniformity trials, together with pot trials for certain problem soils.

196. The results to the end of the 1953 season are summarised as follows:—

Food Crops. (a) Maize. Fertilizer trials were laid down in Toledo and the Northern District. In general there was a marked response to phosphate on the Toledo soils as evidenced by the following figures:—

	TREATMENT				
	Controls (no manure)	P	NP	NPK	NPK lime
Crique Sarco ..	0.62	39.5	30.5	50.0	31.0*
Otoxha ..	0.6	39.0	46.5	57.0	58.0

Weights are those of unhusked cobs per plot: the yield marked * was affected by wee wee ants. These results serve to confirm that the pig-rooted, non-productive village soils can be used for further corn cropping provided the pigs are fenced off and dressings of 1 - 1½ cwt. of Triple phosphate added.

197. A larger and better replicated trial at Paraiso in the Northern Districts gave a significant increase of shelled corn with a complete NPK dressing but failed to reveal the limiting nutrients. Thus with Sulphate of Ammonia at 200 lb./acre, Triple phosphate at 75 lb. and Muriate of Potash at 100 lb./acre the following figures from two blocks and 8 replicates were obtained:—

	TREATMENT				
	Control (No manure)	N	P	K	NPK
Block I and II ..	21.4±8 14.2	19.4±7 12.9	23.1±6 15.4	23.1±5 15.4	32.5±9 lb./plot 21.6* bushels/acre

*Significant at the 5 per cent level.

198. Studies in the use of fertilizers on corn must necessarily also include a study of the yield of the subsequent pulse or grain crop since the comparatively low price of corn does not permit the use of fertilizer at anything like the levels of nitrogen and phosphate needed for a worthwhile increase in grain yield.

199. (b) *Rice*. A variety trial involving four standard American upland varieties was conducted in the Louisville area. There was no significant difference between yields as follows:—

Variety						Yield rough lb. rice/acre
Bluebonnet	..	..	..	..	..	1,400
Century Patna	..	..	..	..	..	1,600
Patna	..	..	..	..	..	1,440
Zenith	..	..	..	..	..	1,600

200. A mixed crop, corn and rice manurial trial was laid down at Paraiso. Because of the exceptionally wet conditions the corn was not harvested and rice results were as follows:—

		TREATMENTS				
Clean padi (lbs.)	Control (no manure)	N	P	K	NPK	
Per plot	31.0±12.7	49±26.8	48±11.3	56±9.1	48.5±4.9	
Per acre	1,500	2,372	2,323	2,710*	2,347	

*Significant at the 0.02 level.

201. In a trial such as this directly following clearing from high bush one would not expect a large increase from the use of Nitrogen. In fact the significant increase due to potash was a measure of the ability of this nutrient to strengthen the straw and keep the ripening heads out of the water. This effect was nullified in the NPK treatment by the presence of the additional Nitrogen.

202. *Red Kidney Beans*. A uniformity trial based on samples from 5 different areas of Central Farm gave a mean yield of 1,476 lb. shelled beans per acre with a standard deviation of—379 lb. The highest yield recorded was 1,859 lb. and the lowest 848 lb.

203. *Pigeon Peas*. A similar uniformity trial with samples taken from the black soils bordering Garbutt Creek gave a mean yield of 490 lb. of peas per acre. This figure is lower than potential yield due to shedding.

204. “*Pine Ridge*” *Investigations*. A start was made in August, 1953, to enlarge the fenced area at Hector Creek and lay down a variety of crops which might show some promise on this problem area, constituting some 12% of the total land resources of B.H. Earlier work had shown the need for phosphate and possibilities for pasture. Further pasture plots were therefore planted out together with pineapples, coconuts, peanuts, tropical kudzu, ramie and pigeon peas.

205. The similarity of “Pine Ridge” to trace element deficient soils in Florida and New Zealand prompted the forwarding of pasture samples from the area to Aberdeen for spectro-graphic analysis. This confirmed the fact that the pine ridge is deficient in Cobalt and low in both molybdenum and copper.

206. The need for phosphate is such that nothing but “pine ridge” herbage will grow without it. Thus 1 cwt/acre of Triple phosphate is the control with which have been compared the effects of subsoiling, liming and the addition of Nitrogen (100 lb. S/A/acre).

207. *Rice*: showed a definite increase in yield on the limed area, and only a slight, non-significant increase with Nitrogen as shown in the following figures:—

WEIGHTS IN LB. CLEAN PADI/ACRE							
Subsoiled				Not Subsoiled			
Limed		Unlimed		Limed		Unlimed	
P	NP	P	NP	P	NP	P	NP
2,787	2,636	1,372	1,977	2,376	2,668	1,901	1,944

The treatment means were as follows:—

	lbs./acre	difference lbs./acre
Subsoiled	2,193	—
Not subsoiled	2,222	+129
Limed	2,617	+819
Unlimed	1,798	—
Phosphate only	2,109	
Nitrogen and phosphate	2,306	+197

208. Grasses.

(a) GUINEA GRASS (*Panicum maximum*) (lb. wet grass/plot)

	First Cut	Differ- ence	Second Cut	Differ- ence
Limed	219	—62	442	—191
Not limed	281		633	
Phosphate only	246	+18	492	+91
Nitrogen and phosphate	264		583	
Subsoiled	369	+238	524	—27
Not subsoiled	131		551	

Note: All plots received phosphate dressings at 100 lb. Triple Super p.a.

Thus the guinea grass has not exhibited the response to lime shown by the rice and as in the case of the rice, the response to Nitrogen even at 7½ months after planting has not justified the cost of the fertilizer.

The first cut was made in the wet season and here the response to subsoiling was very poor. There is no doubt that the treatment channelled the water around the grass roots and that this was a wet season phenomenon is shown by the fact that there was virtually no treatment differences at the second cut made in the dry season.

(b) GUATEMALA GRASS (*Tripsacum laxum*)

	lbs. of wet green/plot matter	Difference
Limed	278	+25
Not Limed	253	
Phosphate only	231	+69
Nitrogen and phosphate	300	
Subsoiled	253	—27
Not subsoiled	280	

This result, a dry season cut, again emphasizes the ineffectiveness of subsoiling and the lack of immediate response to lime: even the small increase of yield due to Nitrogen would not justify its application.

210. Much more work remains to be done on “Pine Ridge” soils, but it appears that, provided drainage is satisfactory and phosphate is used to establish the crop, maintenance of healthy plant growth could be achieved with further annual dressings of phosphate and probably nitrogen and lime sufficient to offset that lost by leaching.

211. There is reason to suspect that one of the difficulties associated with legume establishment on the Pine Ridge will be insufficient nodulation. So far Tropical kudzu, peanuts and pigeon peas have been successfully established and nodules have been found only on the peanuts. Further work is necessary to determine which legumes will have to be inoculated prior to seeding.

212. *Sugar Cane*. A variety trial planted at Louisville in September 1952 was harvested in March 1954. Final results were as follows:—

Variety	Weight of Cane per Acre (Tons)	Refractometer readings (75°F)	Stem borer Incidence (%)
POJ 2878 ..	25.0± 5.5	21.9	8
B41227 ..	25.5± 10.1	22.5	21
B4098 ..	37.8± 19.3	18.6	18
B37161 ..	27.1± 14.8	20.4	12
B3337 ..	22.2± 10.7	21.7	11
B34104 ..	14.5± 6.51*	21.1	9.6
B41211 ..	15.0± 7.3	20.3	21.7
Mean ..	23.87± 10.6	29.0	14.5

*Significant at the 1 per cent level.

213. Thus B4098 was easily the highest yielder but the high standard deviation for plot yields did not establish this increase as significant. This variety was however the one with the lowest sugar content and was fairly susceptible to damage by the cane moth borer (*Diatrea saccharalis*). Nevertheless it is a promising cane. On the evidence of this trial both B34104 and B41211 were disappointing but the latter has done much better elsewhere in the Caribbean.

214. *Sugar Cane Manurial Trial*. A well replicated, randomised block trial was carried out on POJ 2878 at Estrella Estate using 100 lb./acre of each of Sulphate of Ammonia, Muriate of Potash and Triple phosphate and multiples of these quantities. Control had perforce to be 100 lb. of Sulphate of Ammonia because of an all-over application prior to laying down the trial. Results were as follows:—

Treatment			CANE YIELDS		Refractometer Readings (80°F.)	Incidence of Stem Borer (per cent)
			Per plot (lbs.)	Per acre (tons)		
N	..	..	633± 594	11.32—	21.5	7.9
2N	..	..	992± 309	17.71 NS	21.7	4.1
NP	"	..	1,521± 209	27.17 **	21.9	4.3
NK	..	..	616± 313	11.01 NS	21.6	4.1
NPK	..	..	1,315± 407	23.78 NS	20.9	5.4
2NP	..	..	1,462± 897	26.10 NS	21.3	2.8
2NK	..	..	663± 157	11.83 NS	21.3	0.4
2NPK	..	..	1,403± 204	25.65 *	20.9	6.2
Mean	..	..	1,076± 386	19.32	21.38	4.4

215. The marked increase in the value of the Nitrogen when applied simultaneously with phosphate is reflected in the economics of the various treatments as shown below:—

Treatment			Cost of Fertilizer \$	Increase in Yield over N alone (tons)	Value of Increase \$	Net Return of Increase/Acre* \$
2N	..	..	11.60	6.39	50.09	36.49
NP	..	..	13.86	15.85	124.26	108.40
2NP	..	..	27.72	14.78	115.87	86.15
NPK	..	..	19.93	12.46	97.68	75.75
2NPK	..	..	39.86	14.33	112.34	70.48
NK	..	..	11.87	— 0.31	— 2.43	— 11.44
2NK	..	..	23.74	0.51	3.99	— 21.75

*Allowing \$2 cost of spreading fertilizer.

216. *Coconut Fertilizer Trials*. Groups of young plants matched for size, were selected at Blair Atholl (Stann Creek District), Xaibe, Paraíso and Ranchito (Corozal District) and were treated with fertilizer twice per annum, mulched and forked where required for purposes of the trial. Except at Paraíso and Ranchito where response to phosphate has been outstanding, there has been no one treatment consistently good over all replicates. At Xaibe, on the red soils, both K and P alone have given equally good results; at Paraíso mulching alone was equally as effective as fertilizer and at Blair Atholl no one treatment has yet emerged which has bettered the controls. It is however plain that where coconuts are kept free of weed competition, growth is correspondingly much the better.

Measurements taken in May 1954, after three fertilizer applications are summarised below:—

I. OVERALL HEIGHTS IN INCHES:

Locality	Treatment							
	Control (No manure)	N 1 lb. Sulphate Ammonia per tree	P 1 lb. Triple per tree p.a.	K 1 lb. Muriate of Potash per tree p.a.	NPK 1 lb. each	Forked	Mulched	Mean
Ranchito	121	148	171	134	140	141	—	143
Paraiso	48	48	55	46	72	60	76	57.8
Xaibe	123	110	136	130	129	109	—	123

II. GIRTH AT 18INS. ABOVE GROUND:

Ranchito	22	25	36	25	26	20		25.8
Paraiso	8.6	7.5	8.2	8.8	11.3	9.5	12.2	9.4
Xaibe	23.6	23.3	25.3	27.6	25.3	21.5		24.4

217. Fertilizer trials have been laid down at Stann Creek, San Estevan and Louisville, (Corozal), and Teakettle (Cayo) on *Plantains*; whilst there is a lot of information on the effect of fertilizers on bananas, little is available concerning plantains, which are an important local cash crop. Results have yet to be recorded.

218. *Ramie Trials*. In the period November 1953 to January 1954 the Department co-operated with the C.D.C. and laid down a series of trials on the Barton Ramie Estate.

(a) *Fertilizer Studies*. A randomised block layout designed to find the effects of Phosphate and Nitrogen on the yield of fibre resulted in a marked increase with heavy dressings of Sulphate of Ammonia but failed to reveal any response to Phosphate. Thus:—

I. EFFECT OF NITROGEN ON YIELD OF GREEN MATERIAL:

			Weights in lb./plot and per acre			Cwts. of S/A per acre			
			None	1	2	3	4	5	6
Mean per plot			165	238	253	249	258	256	275
SD			+ 13	+ 69	+ 61	+ 21	+ 51	+ 64	+ 37
Per acre			8,343	12,024	12,755	12,553	13,007	12,906	13,839
Significance			—	*	**	**	**	**	**

II. EFFECT OF NITROGEN ON YIELD OF DRY FIBRE:

			Weights in lbs.			Cwts. of S/A per acre			
			None	1	2	3	4	5	6
Mean/plot			1.343	2.124	2.32	2.357	2.65	2.577	2.76
SD			0.22	0.79	0.92	0.25	0.23	0.75	0.59
Per acre			68	107	117	119	134	130	139
Significance			—	NS	*	NS	**	**	**

III. EFFECT OF S/A ON FIBRE CONTENT (%):

			Cwts. of S/A/Acre						
			None	1	2	3	4	5	6
Mean/plot			0.8	0.888	0.894	0.948	1.027	0.999	0.999
SD			0.064	0.15	0.27	0.079	0.056	0.064	0.05
Significance			—	NS	NS	**	**	**	**

IV. THE EFFECT OF PHOSPHATES. (Means of 12 replicates)

Phosphate at 1 cwt./acre				No Phosphate		
	Green Wt. (lb.)	Dried Fibre (lb.)	Fibre (%)	Green Wt. (lb.)	Dried Fibre (lb.)	Fibre (%)
Mean per plot ..	256.6	2.54	0.974	253.1	2.39	0.938
SD	± 49	± 0.58	± 0.116	± 50	± 0.58	± 0.07
Per acre	12,937	128	—	12,760	24	—
Significance ..	NS	NS	NS			

Note: NS, not significant; *, significant 5 per cent level; **, significant 1 per cent level.

219. (b) *Weedicide Trials.* A combined weedkiller and fertilizer trial was laid down immediately after cutting the crop in November 1953. The chemicals applied were Trichloro-acetic Acid at 4, 8 and 12 lb./acre and "Premerge" (DNOSBP) at 5, 7.5 and 12.5 quarts per acre, both in 50 gals. of water. Sulphate of Ammonia was applied at 2 and 6 cwts./acre.

The weed susceptibility is shown by the following table compiled 17 days after treatment:—

	Weed				T.C.A.		Premerger
Grasses:							
<i>Paspalum</i> spp.	..	..	..	..	..	XX	XXX
<i>Digitaria sanguinalis</i>		..	..	..	..	X	XX
<i>Cynodon dactylon</i>	..	..	..	..	..	X	XXX
<i>Echinochloa</i> sp.	..	..	..	..	..		XXX
<i>Eleusine indica</i>	..	..	..	..	..	X	XXX
<i>Panicum trichoides</i>	..	..	..	..	..	X	XXX
Other weeds:							
<i>Amaranthus spinosus</i>	..	..	..	..	..	XXX	XXX
<i>Teramus</i> sp.	..	..	..	..	..	XXX	XXX
<i>Dolichos minimus</i>	..	..	..	..	..	XXX	XXX
<i>Desmodium tortuosum</i>		..	..	..	..	XX	XXX
<i>Sida acuta</i>	..	..	..	..	..	XXX	XX
Hog weed	..	..	..	..	..	XXX	X
<i>Achyranthes indica</i>	..	..	..	..	..	XXX	X
Unidentified:							
Composites	..	..	..	..	..	XXX	X
Malvaceae	..	..	..	..	..	X	X
Solanaceae	..	..	..	..	..	XXX	X

x, highly susceptible; xx, moderately resistant—retarded only; xxx, resistant.

Even in concentrations as low as 4 lb./acre the TCA was much too toxic to the ramie crop. It should be noted, however, that its efficiency as a grass killer even at 4 lb./acre exceeded that of the DNOSBP compound. The optimum crop growth was obtained from the application of 7.5 quarts DNOSBP together with the heavy dressing of Sulphate of Ammonia and this was recommended for large scale adoption on the Estate. Such a treatment (weedicide alone) could be applied for \$7 to \$8 per acre whereas one handweeding alone costs \$12. At 33 days after application the ramie in these DNOSBP-treated plots was measured for height and with controls equalling 100, the treated crop was 148 and 132 for 7½ qts./acre and 5 qts./acre respectively. The better weedkill at the heavier rate for application justified the extra expense involved. This field data for weedicide effect without fertilizer is summarised below:—

Days after Application							
Treatment		5		13		33	
		Height (inches)	Weed Cover (C—100)	Height (inches)	Weed Cover	Height	
TCA:							
4 lb.	..	—	80	13	75	23	
8 lb.	..	4	90	12	75	15	
12 lb.	..	2	20	10	20	12	
DNOSBP:							
5 quarts	..	4	15	15	20	46	
7.5 quarts	..	4	10	14	10	41	
12.5 quarts	..	3	40	7	20	18	
Controls ..	..	6	100	16	100	31	

A trial on a field scale involving 1 acre per treatment was laid down in March 1954 to compare the efficiency of Dow General Weedkiller (40% DNOSBP), Sodium Pentachlorophenate and Dow "Premerge" in their ability to control weeds in the staged crop prior to the flush of growth expected at the start of the rains. Premerge gave by far the most satisfactory and persistent weed kill and results as at 13th April, 1954—15 days after application are shown below:—

Weed	TREATMENT		
	Dow General 4 pints — 5 gals. power kerosene 25 gals. water/ac	Sodium Pentachloro- phenate 30 gals. water	Premerge 7.5 quarts/acre in 30 gals. gals. water
Nutgrass (<i>Cyperus rotundus</i>)	xx	x	x
Other Cyperaceae	xx	xx	x
Grasses:			
<i>Digitaria sanguinalis</i> ..	xxx	xxx	xx
<i>Axonopus compressus</i> ..	xxx	xx	xx
<i>Panicum barbinode</i> ..	xxx	x	xxx
<i>Cenchrus echinatus</i> ..	xxx	xxx	xx
<i>Panicum trichoides</i> ..	x	xx	x
<i>Paspalum conjugatum</i> ..	xxx	xxx	xxx
<i>Eleusine indica</i>	xxx	xxx	xxx
Other weeds:			
<i>Sida acuta</i>	xxx	xxx	xxx
Composites	x	x	x
Malvales	xx	xx	x
<i>Polygonum</i> spp. ..			
Hogweed	x	xx	x
Wild plantain	xxx	xx	xxx

x, highly susceptible; xx, moderately resistant—retarded for some weeks; xxx, resistant.

220. (c) *Seed Emergence Studies*. A high pre-emergence mortality occurs in all classes of farm seeds due to the ravages of red ants and soil-inhabiting fungi. A series of trials were initiated to determine the effect of method of planting (drilling v local method of using the planting stick) and the effect of a seed protectant upon the subsequent emergence rate and seedling vigour. Results in general were erratic but there was some evidence to show that stick planting gave more vigorous seedlings and that an economic increase in germination rate resulted from seed dusting with Fernesan. The results in summary recorded 15 days after planting were as follows:—

(a) *Green Gram Beans (Phaseolus mungo)*

Treatment	Germination %	Wt. of Seedling grms.	Seedlings Length (mm.)
Not dusted—			
Drilled	57 ± 7.2		
Stick planted	66 ± 7.1		
Dusted—			
Drilled	67 ± 2.4		
Stick planted	78 ± 3.8		

(b) *Black Eye Peas (Vigna catieng)*:

Not dusted—			
Drilled	71 ± 6.5	163	89 ± 12
Stick Planted	84 ± 1.0	389	162 ± 14
Dusted—			
Drilled	67 ± 4.5	156	89 ± 22
Stick Planted	87 ± 2.3	368	150 ± 13

(c) *Maize (Zea mais)*

Not dusted—			
Drilled	93.6	680	
Stick planted	96.6	857	
Dusted—			
Drilled	94.3	822	
Stick planted	94.6	921	

(d) *Red Kidney Beans (Phaseolus vulgaris sp.)*

Not dusted—				
Drilled	..	..	94 ± 1.4	1,375
Stick planted	..	..	89 ± 3.3	1,169
Dusted—				
Drilled	..	..	95 ± 2.5	1,304
Stick planted	..	..	93 ± 1.6	1,254

Discussions. Although results were erratic there is ample evidence to show the value of the traditional method of using a planting stick at bean planting time i.e. October to December. The planting stick makes a hole deep enough to create around the seed a micro climate suitable for germination: it seats the seed on firmed ground, (which drilling cannot do, there being no agricultural rollers in the Colony), and retains morning dew well into the day. By contrast, the shallower drilling of beans in a self-mulching rubble makes it more difficult for the seeds to obtain adequate moisture. With regard to the number of plants emerging when using dusts, even a 2.3% increase would be soundly economic since 1 - 2 oz. for every 60 lb. of seed costs only a few cents. For green gram this increase in the number of plants resulting from dusting was of the order of 17%.

TOBACCO

221. A Tobacco Officer appointed under C.D. & W. Scheme D.2117, to carry out trials with cigarette and cigar leaf tobacco arrived in the Colony in December. He is at present preparing plans for trials to be conducted at Central Farm and in the Orange Walk area.

LAND CLEARING

222. The Land Clearing Engineer assumed duty on the 4th June, and spent his first two months assembling and testing the unit equipment, and engaging and training operators at the Central Farm.

223. Temporary accommodation arrangements had to be made for the staff, as originally this scheme, (C.D. & W. D.1868), had conceived that they would be migratory; the position remains as such, although experience has now shown that a central workshop base and its staff is a necessity at the Central Farm and provision is being included in a second revision of the scheme for this.

224. Temporary storage and garage accommodation have been provided using local materials and a second hand Nissen hut.

The Equipment obtained for the unit comprises:—

- 2 D4 Caterpillars with blades, bush rakes and one Hyster winch.
- 2 D8 Caterpillars with blades (second-hand), one bush rake and one stump.
- 1 Dodge Power Wagon
- 2 Turner Diesel Tractors
- 1 Ransome Baron Harrow, for Turner Diesel
- 1 Ransome Baronet Harrow do. do.
- 2 Rome Plough Harrows for D4s
- 1 Hyster Crane for D4.

225. The two D8s were taken over after two years gruelling work with the Public Works Department on the construction of the Humming Bird Highway; this was an economy measure, though D7s had been advised and requested for the scheme. It has resulted in expensive and complete overhauls being necessary, and the fact that neither could be successfully operated during the year.

226. The work done therefore was limited to the two D4s, which operated mainly in fairly light bush regrowth conditions, which were found to be easier clearing than had been expected.

227. Experience showed that bushing with the blade, followed by windrowing with the rake was more effective and moved almost no topsoil in comparison to doing both as one operation. Even so a small amount of whippy undergrowth tends to be left, which can most economically be removed by hand.

228. The first year's working is being regarded as experimental whilst the problems involved are being surmounted and differing techniques tested. Already it is plain that the unit cannot be divided into four widely scattered and independent operating groups, as supervision and maintenance become impossible. Two separate sections must be the maximum, and even then they should be within one District. Inevitably this will lead to disappointments where land-owners are anxious to press ahead with development, but the transport costs of heavy equipment are additionally heavy and aggregate areas for work in any district must be sufficiently large to allow the transfer of the Unit to be worthwhile.

229. It is also impossible to carry out work practically either for people with very small acreages or those who have no security or permanency on the land to be cleared. Nonetheless there is a considerable programme of 'bookings' in view and the Unit already has enough work for at least another year ahead.

230. Applicants are requested to sign a form before work commences, and it has been policy to clear only land which will be devoted ultimately to permanent cropping or pasture.

231. Costs charged for D4 work during the experimental period have been at \$5 per machine hour, which covers operating expenses and allows for a large proportion of the depreciation, but not for supervision and central expenses.

232. The Unit had completed 273 acres, bushing and windrowing, and 282 and 255 heavy and light harrowing for five individuals by the end of the year in the Cayo District, and is already making a visible contribution to agricultural development.

LAND USE SURVEY

233. This Colony-wide survey, by a three man team, which was started in August 1952, continued throughout the year and although the Unit severed its tenuous connections with the Department, liaison was maintained in particular through the 'Scatter plot' programme and the work of the Experimental Officer.

234. The Unit examined and mapped the soils of some 5,400 sq. miles, making a total of 6,800 sq. miles surveyed since August 1952, and it is estimated that the work will be completed by June 1954.

235. Whilst it would be premature to anticipate the final report, the Unit, at present considers that some 4,626 sq. miles of the areas examined have 'good' soils i.e. those that have a reasonable level of natural fertility and no inherent properties other than slope that would make them difficult to bring into production; whilst those grouped as 'poor' soils cover some 4,220 sq. miles.

PESTS AND DISEASES

236. (a) *Insects*. Locusts, *Schistocerca paranensis*, were reported in small numbers in the Northern Districts on the 6th June. Small swarms were observed in corn at Richmond Hill, Caledonia, Yo Creek, San Lazaro, San Antonio, Chan Pine Ridge and Xaibe, but little or no serious damage was reported, and no egg laying was observed. Numbers were estimated at 200 per acre, and each centre to cover about 2 to 3 acres. All had disappeared by the end of the month.

237. *Wee Wee Ants*, (*Atta cephalotes*), continue to be one of the major troubles to crops, but the field staff have successfully demonstrated that they can be efficiently controlled by the use of 'Synklor', and many farmers are now following this up. 'Aldrin' is also proving a good control.

238. The Coconutbeetle, (*Rhyncophorus palmarum*) continues to take a toll of palms particularly in the North and Northern Caye areas; though only a few farmers bother to practice any worthwhile control measures.

239. During Mr. Krauss's visit he discovered an insect probably *Leionota* sp.? which may be a predator on this beetle.

240. There was a serious outbreak of froghoppers, *Aeneolamia postica jugata* (Fowler) around San Joaquin, Calcutta and Pembroke Hall affecting 50 acres of cane in September.

241. Weevil damage to Maize both in the field and in the storage cribs is considerable.

242. No other serious insect pests were recorded during the year, though many cut-worms etc. continue to be troublesome.

243. (b) *Diseases.* (1) *Stock*:—As reported in paragraph 105, *Swine Fever* was diagnosed in July at Patchakan in the Corozal District. The two northern districts were quarantined and a vaccination campaign carried out, but because of incomplete co-operation and the presence of wild vectors, subsequent flare ups of the disease have occurred. The quarantine area has been maintained and the disease has not spread south to other districts.

244. One carcase of pork was also condemned in January at the Belize Slaughter House because of *Swine Erisypelas*.

245. Although there was no instance of disease here precautionary action was taken in conformity with other B.W.I. territories to restrict by permit imports of pork products emanating from the U.S.A. because of the outbreak of *Vesicular exanthema* there.

246. Amongst cattle a case of *Bovine coccidiosis* was diagnosed in Toledo district, and three imported bulls died of *Texas fever* in Cayo. One carcase was condemned at Belize because of *Bovine tuberculosis* in January.

247. *Fowl Botulism* recurs endemically in the northern district and *Fowl Cholera* was diagnosed in Belize in December.

248. Plans are taking shape for the Veterinary Officer to undertake a comprehensive animal disease survey in 1954.

249. (2) *Crops*:—*Red Ring* disease continues to occur amongst coconuts sporadically, but, as for the Rhinoceros beetle pest, only a few growers attempt control.

250. Dieback in the older planted grapefruit in the Stann Creek Valley is causing some concern, but as far as can be ascertained this is due to *Gummosis* and poor drainage.

251. Various other fungal diseases tend to take some toll of crops, including rusts and *anthracnose* on beans.

LEGISLATION

252. The following Statutory Instruments were enacted during 1953:—

No. 11 of 1953	..	..	Importation of Foreign Animals.
No. 44 of 1953	..	..	Swine Fever (Infected Places) Order.

Additionally the import of Pork products was controlled under permit.

COMMITTEES AND CONFERENCES

253. The Director served as a member of the Marketing Board, of the Agricultural Credits Fund sub Committee, of the Listowel School Advisory Committee and of the Development Committee; he was Chairman of the Permanent Exhibition Committee.

He attended the Colonial Directors of Agriculture Conference at Wye in September, the Cocoa Conference in London, and the Commonwealth Sugar Conference.

VISITORS

254. Visitors to the Central Farm during the year included:—Commander Douglas Marshall, M.P. and Mr. James Royle, M.P.; Prof. Asprey, and Prof. Parry of the University College of the West Indies; Mr. Catchpole, Labour Adviser and Mr. Percival, Asst. Ecom. Adviser to C.D. & W. Barbados; Mr. N. D. Watson, Head of the Social Services Dept. B. Colonial Office, The Rt. Hon. Henry Hopkinson, C.M.G., M.P., Minister of State, Colonial Office; Mr. A. E. Maynier, Permanent Secretary, Ministry of Trade and Industry, Jamaica; Mr. R. H. Wyche, F.A.O. Rice Specialist, Jamaica; Mr. Noel Krauss, Entomologist, Hawaii; Mr. E. F. H. De Vriendt, Secretary General of the Caribbean Commission, and Dr. R. A. E. Galley, Director of the Colonial Products Laboratory; His Excellency the Governor, heads and members of Departments, as well as numerous private individuals, were also frequent visitors.

ACKNOWLEDGEMENTS

255. In conclusion I should wish to pay tribute to the good work done by all staff during the year and to record my thanks for the co-operation received from other Departments and individuals both inside and outside the Colony; in particular I should like to record my sincere debt of gratitude to the Director and the Department of Agriculture in Jamaica, who have on many occasions assisted us in numerous ways.

J. W. D. GOODBAN,

Director of Agriculture.

SUMMARY OF RAINFALL FOR 1953

BRITISH HONDURAS

APPENDIX I.

Table I.

DISTRICT AND STATION	MONTH												TOTAL 1953	TOTAL 1952
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
COROZAL DISTRICT														
Corozal Town	0.73	1.79	0.35	0.00	4.44	3.23	7.05	3.95	6.35	9.75	0.53	1.30	38.74	71.44
Corozal Agstat	0.57	0.58	0.54	2.14	5.78	1.44	10.76	3.08	8.94	9.78	0.65	0.68	44.94	66.18
Louisville	0.58	0.74	0.00	0.00	7.72	4.89	7.87	4.94	7.62	9.54	1.59	3.16	48.65	80.00
Santa Cruz	1.09				5.86	4.65	7.25	7.87						
Pembroke Hall	0.74	0.91	0.59	0.00	5.54	4.64	6.45	4.06	8.67	6.70	1.62	2.29	42.21	
ORANGE WALK DISTRICT														
Orange Walk Town ..	1.03	2.01	0.85	0.03	6.14	7.55	9.80	5.01	14.51	9.19	2.08	2.02	60.22	57.09
Gallon Jug	0.78	1.45	0.92	0.50	4.15	6.70	7.82	5.28	10.45	7.14	1.91	3.06	50.16	67.95
San Estevan	2.59	1.25	0.80	0.00	5.82	7.04	10.74	5.12	18.66	14.88	2.48	6.80	76.18	74.78
August Pine Ridge ..	0.99	0.67	0.75	0.00	2.05	3.65	10.41	4.60	13.36	3.89	0.56	2.09	43.02	72.76
BELIZE DISTRICT														
San Pedro	2.03	0.50	0.63	0.00	5.64	0.11	4.79	0.96	7.77	5.14	1.83	4.66	34.06	
Half Moon Cay	1.23	1.19	0.19	0.08	1.84	2.77	2.64	3.58	5.02	9.07	10.06	8.28	45.95	
Maskalls	1.25	1.17	0.55	0.00	2.96	8.45	8.22	4.87	9.31	5.67	2.88	2.14	47.47	
Luckystrike			0.81	0.00	5.60	4.62	6.24	5.16						
Salt Creek	2.24	0.72	0.27	0.00	2.17	5.40	6.87	2.54	10.97	12.10	4.51	3.96	51.75	
Stanley Field	1.35	0.93	0.52	0.00	3.34	6.97	4.22	5.41	4.93	14.91	8.21	3.06	53.85	
Belize	3.67	1.02	0.95	0.14	4.11	8.14	4.91	7.22	7.63	9.51	8.63	9.15	65.08	58.39
Gracie Rock	1.24	7.03	0.62	0.05	5.60	8.81	7.61	5.85	13.32	11.76	6.97	4.20	73.06	73.56
CAYO DISTRICT														
Benque Viejo	0.16	1.59	0.12	0.00	8.73	1.98	6.00	4.18	6.93	7.37	4.49	5.87	47.42	56.99
Cayo Town	0.91	0.69	0.46	0.00	7.56	1.66	3.24	2.65	5.90	5.31	5.67	2.90	36.95	50.95
Listowel	0.16	1.06	0.36	0.00	7.51	2.96	5.06	4.17	7.00	6.31	3.19	2.89	40.67	63.63
Central Farm	0.19	1.01	0.40	0.02	8.27	2.56	4.95	4.82	8.09	3.39	3.72	3.05	42.47	63.01
Barton Ramie	0.44	1.05	0.93	0.02	6.79	3.60	6.02	4.29	8.35	7.05	4.76	3.84	47.14	70.46
Augustine	1.70	1.51	0.34	0.25	4.81	2.40	3.76	6.21	8.50	7.66	5.40	3.41	45.95	72.76
Roaring River	2.14	2.65	1.52	0.22	8.14	7.05	6.52	6.58	14.01	4.76	7.46			
Sibun Camp	1.90	3.32	1.88	1.27	10.36	11.17	11.71	12.29	14.76	9.33	7.97	4.29	90.25	
Norland	0.18	0.91	0.43	0.05	9.82	3.34	5.16	5.92	10.24	4.23	3.06	3.89	47.23	
STANN CREEK DISTRICT														
Stann Creek Town ..	0.80	0.72	0.65	0.00	1.97	4.97	5.75	5.48	9.79	14.60	7.49	4.14	56.36	73.51
Melinda Farm	1.52	1.29	0.85	0.01	4.80	7.10	8.21	9.26	10.28	17.40	13.42	3.65	77.79	81.39
Stann Creek Agstat ..	1.19	1.59	0.57	0.01	3.48	4.15	8.22	10.68	12.59	17.06	10.70	4.06	74.30	92.21
Pomona	0.91	2.65	1.02	0.00	5.42	4.71	9.80	13.02	16.80	9.73	7.62	2.45	74.14	91.28
False Creek	1.35	2.62	1.52	0.06	6.54	8.53	10.16	12.02	15.37	13.48	9.32	3.48	84.81	88.88
Cow Creek	0.99	2.93	1.66	0.01	5.93	9.82	11.10	14.21	7.86	11.79	10.56	4.20	81.06	98.52
New Farm	Starts	3.08	1.97	0.54	6.58	9.14	11.59	14.83	18.67	12.75	11.25	4.67		
Alta Vista	2.23	3.36	1.51	0.10	5.41	11.14	10.72	14.65	18.68	13.10	9.97	3.79	94.56	
Tipperary	1.06	3.03	1.48	0.00	5.83	7.13	12.56	15.56	21.91	16.60	11.82	4.45	101.43	
Unity Farm	0.89	3.60	1.39	0.00	5.97	6.95	13.02	15.54	21.87	16.06	10.75	3.96	100.00	
Middlesex	4.27	3.35	1.84	0.36	9.75	13.46	12.73	12.74	16.82	10.35	6.50	3.49	95.66	
Regalia	1.24	1.33	0.50	0.42	4.91	5.41	5.95		7.86	No longer extant				74.92
Blair Athol	0.57	1.93	0.83	0.07	7.26					No longer extant				
Mango Creek	1.92	1.83	0.65	0.00	10.33	6.10	8.57	12.24	10.81	10.94	12.06	2.17	77.62	
TOLEDO DISTRICT														
San Antonio	1.36	2.12	2.14	0.30	7.46	17.24	14.89	8.75	6.10	9.93	9.16	2.92	82.37	
Punta Gorda Agstat ..	1.66	2.83	2.14	0.32	12.64	25.19	19.35	20.64	13.72	5.46	7.02	5.67	116.64	144.37
Hunting Caye	6.59	3.93	0.22		7.05		12.89	14.23	16.83	19.45	31.20	7.86		
Punta Gorda Town ..	1.75	4.18	1.96	0.00	13.95	27.29	22.86	23.70	19.60	5.57	7.20	5.48	133.54	148.36
Barranco	1.94	4.19	7.07	0.15	16.59	29.09	29.50	36.08	19.97	4.49	7.26	4.39	161.72	

Table 2.

	PRESSURE		TEMPERATURE				HUMIDITY	
	Mean Barometric Pressure		Mean Monthly Maximum		Mean Monthly Minimum		Mean Monthly Relative Humidity	
	Belize	Stann Creek	Belize	Stann Creek	Belize	Stann Creek	Belize	Stann Creek
January	30.058	30.029	75.3	81.0	70.3	62.1	88 %	77 %
February	29.987	29.984	78.2	83.0	75.5	67.0	91 %	81 %
March	29.964	29.918	84.1	85.0	78.3	68.0	87 %	74 %
April	29.841	29.642	82.9	90.0	80.7	72.0	90 %	72 %
May	29.838	29.636	86.0	91.0	80.7	74.0	89 %	79 %
June	29.875	29.860	85.3	91.0	81.3	73.0	90 %	79 %
July	29.943	29.902	84.3	90.0	79.8	72.0	88 %	78 %
August	29.901	29.919	84.4	89.0	82.4	73.0	91 %	74 %
September	29.836	29.848	83.3	88.0	81.1	73.0	90 %	77 %
October	29.893	29.878	80.5	88.0	78.7	70.0	89 %	81 %
November	29.991	29.968	77.8	85.0	76.2	70.0	90 %	78 %
December		30.313		85.0		63.0		76 %

APPENDIX II.

AGRICULTURAL IMPORTS 1953 — Customs Department figures

<i>Item</i>										<i>Quantity</i>	<i>Value</i> \$
Cattle for breeding	..	..	..	..	..	..	..	No.		35	8,728
Cattle for slaughter	..	..	..	..	..	..	..	..		—	—
Poultry for breeding	..	..	..	..	..	..	..	..		3,313	2,048
Biscuits— Sweet	..	..	..	..	..	..	..	x 100 lb.		841	44,852
Unsweetened	..	..	..	..	..	..	..	..		163	8,100
Butter	..	..	..	..	..	..	..	..		1,495	125,344
Butter Substitutes	..	..	..	..	..	..	..	..		3,292	106,261
Cheese	..	..	..	..	..	..	..	..		1,598	91,914
Cocoa, prepared	..	..	..	..	..	..	..	..		336	22,065
Coffee— Ground	..	..	..	..	..	..	..	..		187	12,149
Substitutes	..	..	..	..	..	..	..	..		96	19,886
Eggs, fresh	..	..	..	..	..	..	..	doz.		4,880	4,443
Fish, preserved	..	..	..	..	..	..	..	x 100 lb.		856	33,287
Rice	..	..	..	..	..	..	..	..		23,769	323,057
Flour	..	..	..	..	..	..	..	..		88,958	710,519
Peas and Beans— R.K.	..	..	..	..	..	..	..	..		5,971	108,428
Others	..	..	..	..	..	..	..	..		2,218	41,644
Lard and Substitutes	..	..	..	..	..	..	..	..		10,323	259,454
Beef in Barrels	..	..	..	..	..	..	..	..		1,129	36,144
Pork in Barrels	..	..	..	..	..	..	..	..		2,916	70,337
Pork, mess	..	..	..	..	..	..	..	..		—	—
Preserved meat, canned	..	..	..	..	..	..	..	..		2,303	132,550
Ham and Bacon	..	..	..	..	..	..	..	..		523	46,743
Milk— Condensed	..	..	..	..	..	..	..	..		18,687	479,435
Unsweetened	..	..	..	..	..	..	..	..		6,402	145,379
Powdered	..	..	..	..	..	..	..	..		2,114	62,301
Sugar—Refined	..	..	..	..	..	..	..	..		8,022	81,430
Spices	..	..	..	..	..	..	..	..		136	15,584
Vegetables— Onions	..	..	..	..	..	..	..	..		3,879	35,154
Potatoes	..	..	..	..	..	..	..	..		6,955	60,793
Garlic	..	..	..	..	..	..	..	..		130	5,406
Other Fresh	..	..	..	..	..	..	..	..		883	12,061
Canned	..	..	..	..	..	..	..	..		1,929	50,263
Tobacco	..	..	..	..	..	..	..	..			189,546

AGRICULTURAL EXPORTS 1953.

Item								Quantity	Value
									S B.H.
Bananas ..	..	..	..	..	..	..	bunches	27,166	52,236
Plantains ..	..	..	..	..	..	..	..	3,729	1,096
*Citrus— Grapefruit, fresh ..	..	..	..	..	..	..	x 100 lb.	32,817	117,345
Grapefruit, juice ..	..	..	..	..	..	..	..	7,736	64,280
Grapefruit, segments canned ..	..	..	..	..	..	..	..	45,064	604,457
Grapefruit, concentrate ..	..	..	..	..	..	..	lb.	50,000	12,500
Oranges, fresh ..	..	..	..	..	..	..	100 lb.	3,865	5,046
Oranges, concentrate ..	..	..	..	..	..	..	lb.	6,000	2,820
Oranges, juice ..	..	..	..	..	..	..	100 lb.	3,430	43,671
Other Fruit ..	..	..	..	..	..	..	..	1,215	2,625
Vegetables, Other ..	..	..	..	..	..	..	lb.	2,038	149
Spices, Annatto ..	..	..	..	..	..	..	..	—	—
Maize ..	..	..	..	..	..	..	x 100 lb.	17,579	53,485
Sugar, unrefined ..	..	..	..	..	..	..	..	18,193	125,525
Poultry ..	..	..	..	..	..	..	..	—	—
Eggs, fresh ..	..	..	..	..	..	..	doz.	989	621
Coconuts ..	..	..	..	..	..	..	x 100 nuts	14,248	95,451
Copra ..	..	..	..	..	..	..	100 lb.	4,027	44,731
Coconut Oil ..	..	..	..	..	..	..	..	—	—
Cohune— kernels ..	..	..	..	..	..	..	lb.	998,158	129,192
meal ..	..	..	..	..	..	..	..	—	—
oil ..	..	..	..	..	..	..	galls.	7,938	16,444
Cacao ..	..	..	..	..	..	..	..	—	—
Ramie Fibre ..	..	..	..	..	..	..	lb.	66,869	25,231
Mangrove Extracts ..	..	..	..	..	..	..	x 100 lb.	2,156	9,453
Hides and Skins—Alligator Skins ..	..	..	..	..	..	..	lb.	5,490	11,010
Fish—Fresh ..	..	..	..	..	..	..	lb.	62,696	16,204
Dried ..	..	..	..	..	..	..	lb.	28,883	5,206
Lobsters— Fresh ..	..	..	..	..	..	..	lb.	14,748	3,019
Tails ..	..	..	..	..	..	..	lb.	143,240	75,288
Conch ..	..	..	..	..	..	..	lb.	8,375	1,237
Turtle ..	..	..	..	..	..	..	..	—	—
Hawksbill, Tortoise and Other Shell ..	..	..	..	..	..	..	lb.	1,803	3,162
Shrimps ..	..	..	..	..	..	..	lb.	2,275	1,500
Dried Beans ..	..	..	..	..	..	..	x 100 lb.	501	9,017
*Citrus— Grapefruit Oil ..	..	..	..	..	..	..	lb.	4,731	8,393
Orange Oil ..	..	..	..	..	..	..	lb.	1,820	3,315

APPENDIX III.

LIVESTOCK—SLAUGHTER HOUSE RETURNS 1953

DISTRICT	CATTLE		SWINE		SHEEP		GOATS	
	Total		Total		Total		Total	
	No.	Weight lb.	No.	Weight lb.	No.	Weight lb.	No.	Weight lb.
Cayo ..	237	25,138*	613	24,851*	40	974*	—	—
Belize ..	2,739	621,610	5,920	313,994	164	4,965	16	333
Orange Walk ..	100	14,621	374	20,520	5	203	1	25
Stann Creek ..	105	26,641	278	21,669	20	643	—	—
Toledo ..	22	5,614	219	12,442	1	32	—	—
Corozal (estimated) ..	47	4,700	342	17,100	7	300	—	—
COLONY TOTAL 1953 ..	3,250	698,324*	7,746	410,576*	237	7,117*	17	358
COLONY TOTAL 1952 ..	3,074	722,023	7,924	458,290	232	7,585	29	510
COLONY TOTAL 1951 ..	3,226	811,326	5,828	330,047	156	6,225	?	?

*No weights recorded for Cayo first six months; total figures therefore incomplete.

APPENDIX IV.

IMPORT AND EXPORTS LIVESTOCK 1953

IMPORTS																				EXPORTS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
POULTRY						CATTLE				HORSEKIND				OTHER KINDS						Table Eggs	Horsekind	Dogs	Parrots																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Day Old Chicks	Fowls	Day Old Poults	Hatching Eggs	Bulls	Heifers	Calves	Working Steers	Slaughter Animals	Stallions	Mares	Fillies	Mules	Sheep	Goats	Rabbits	Canaries	Dogs	Cats																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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*As shown in Appendix II, the Customs Department show 16 Bulls imported instead of 21 as above; also Poultry imports as 3,313, and eggs as 984 doz.

APPENDIX V.

STAFF LIST AT 31st DECEMBER 1953

<i>Post</i>	<i>Name</i>	<i>Station</i>	<i>Remarks</i>
Director of Agriculture	J. W. D. Goodban	Headquarters	On leave 10.8.53.
Senior Agricultural Officer	G. B. Gregory	Headquarters	
Agricultural Officers	G. A. Southwell	Punta Gorda, Toledo	Returned from leave 7.7.53.
	C. M. Grieve	Stann Creek	
	S. J. A. Williams	Orange Walk	Arrived 16.3.53
			<i>C.D. & W. Scheme</i>
Agricultural Education Officer	C. A. S. Hynam	Central Farm	Arrived 22.6.53 .. D.1808
Land Clearing Engineer	J. B. Hutchinson	Central Farm	Appointed 4.6.53 .. D.1868
Tobacco Officer	G. L. Wanrooy	Central Farm	Arrived 15.12.53 .. D.2117
Veterinary Officer	F. Manolson	Belize	Appointed 12.10.53 ..
Development Officer	R. Coe	Central Farm	Appointed 16.7.53 .. D.1807
Experimental Officer	Y. E. Vial	Central Farm	Appointed 9.6.53 .. R473A & D1807A
Livestock Officer	S. S. Dale	Central Farm	D.1236
Rice Officer	Vacant		D.2124
Assistant Agricultural Officer	F. F. Orio Jr.	Cayo	
Temporary Agricultural Instructor	E. G. Russell	Punta Gorda	On three years Study Leave as from 1.8.53
Senior Farm Demonstrators	F. F. Orio Sr.	Orange Walk	
	P. B. Lizarraga	Corozal	
Farm Demonstrator Grade I	C. D. W. Atkins	Barranco	
	H. S. Nelson	Belize	
	J. A. Lizama	Louisville	
	J. A. Swasey	Stann Creek	
	I. S. Stephenson	Punta Gorda	
Farm Demonstrator Grade II	T. L. Brackett	Stann Creek	
	W. A. Grant	Belize	
	W. J. Baeza	Central Farm	Seconded to Scheme D.1236 as Livestock Assistant
	F. Bautista	Succotz	Returned from leave 15.1.53
Foreman Mechanic	W. A. Saunders	Central Farm	
Mechanic	H. E. Young	Central Farm	
Temporary Farm Demonstrators	T. Ramos	Stann Creek	Acting Farm Demonstrator, Grade II .. D.1807
	N. L. Williams	Stann Creek	"
	A. Thompson	Sittee	"
	E. Bautista	Carolina	"
	A. Gentle	Dump, Toledo	"
	E. O. R. Gill	Lucky Strike	"
	J. A. Santos	Grace Bank	"
	J. Chief	Roaring Creek	"
	G. I. Marin	Cayo	"
	C. Torres	Yo Creek	"
	G. C. Castillo	Punta Gorda	"
	H. Robateau	Central Farm	(Appt. term, 16.11.53) "
	J. Gonzales	Orange Walk	"
	W. T. Ebanks	Land Use Survey	"
	E. G. Waight	Central Farm	(Resigned 1.10.53) "
	L. V. Gabourel	Cayo	"
	A. P. Bautista	Punta Gorda	"
	F. B. Arana	Barranco	"
Accountant	G. M. Young	Headquarters	Seconded from General Clerical Estab. to C.D. & W. Scheme D.1807
Storekeepers and Recorders	C. L. Williams	Punta Gorda	C. D. & W. Scheme D.1807
	R. G. Smith	Orange Walk	
	Vacant (2)		

APPENDIX VI

PLANT AND SEED INTRODUCTIONS—1953

Pumpkin var. "Peraoro"					
<i>Cucurbita moschata</i>	..	seed	..	Inst. Inter Americano Ciencias Agricola, Turrialba, Costa Rica	
Avocado Pear, var. Collinson					
<i>Persea gratissima</i>	..	..	budwood	Federal Experimental Station, Mayaguez, Puerto Rico.	
Avocado Pear, var. Winslowson					
<i>Persea gratissima</i>	..	..	budwood	Federal Experimental Station, Mayaguez, Puerto Rico	
Pineapple "Natal Queen"	..				
<i>Ananas sativus</i>	..	..	suckers	..	Florida, U.S.A.
Pangola Grass					
<i>Digitaria decumbens</i>	..	bundle	..	Department of Agriculture, Grove Place, Jamaica.	
Brazilian Molasses Grass					
<i>Melinis minutiflora</i>	..	bundle	..	Department of Agriculture, Grove Place, Jamaica	
Yam: Coconut Lisbon, Horn, Oriental, Bottleneck Lisbon					
<i>Dioscorea species</i>	..	..	plants	..	Department of Agriculture, Barbados
Agave lecheguilla	..	..	plants	..	Kew
<i>Litchi Chinensis</i>	..	..	seed	..	U.S. Plant Introduction Garden, Coconut Grove, Florida, U.S.A.
Sugar Cane, variety B3439	..	cuttings	..	B.W.I. Central Sugar Cane Breeding Station	
Queensland Nut					
<i>Macadamia ternifolia</i>	..	seed	..	Sub.-trop. Experimental Station, Homestead, Florida.	

APPENDIX VII.

FINANCIAL STATEMENT 1953

EXPENDITURE

Head 2—Agriculture

Subhead

1. Personal Emoluments	..	..	..	..	..	\$45,389.59
2. Transport Allowances	..	..	..	..	..	1,384.84
3. Travelling and Subsistence	..	..	..	..	..	3,920.23
4. Running and Maintenance Costs of Vehicles	..	..	..	..	..	4,519.14
5. Freight on Plants, etc.	..	..	..	..	..	178.44
6. Scientific Equipment	..	..	..	..	..	3.80
7. Incidentals	..	..	..	..	..	123.82
8. Upkeep of Farm Equipment	..	..	..	..	..	266.60
9. Upkeep of Temporary Buildings	..	..	..	..	..	154.22
10. Labour	..	..	..	..	..	9,978.04
11. Control of Pests and Diseases	..	..	..	..	..	1,120.35
12. Implements and Tools	..	..	..	..	..	515.28
13. Revenue Producing Operations	..	..	..	..	..	11,932.56
14. Agricultural Extension	..	..	..	..	..	1,685.16
15. Boats and Doreys	..	..	..	..	..	149.21
16. Visits of Specialists	..	..	..	..	..	499.03
17. Veterinary Drugs	..	..	..	..	..	1,536.90
18. Housing Rentals	..	..	..	..	..	1,022.50
18. A Post Selection Training Course (C. M. Grieve)	..	..	..	..	..	1,050.00
19. Supervision, Maintenance of Grounds, Offices, Buildings	..	..	..	..	..	8,655.41
20. Experiments and Trial Plots	..	..	..	..	..	8,490.64
21. Commercial Crops Operations	..	..	..	..	..	8,103.23
22. Mechanical Equipment for Baking Pot Estate	..	..	..	..	..	1,342.17
23. Veterinary Equipment	..	..	..	..	..	721.31
24. Purchase of Vehicles	..	..	..	..	..	4,463.00
25. Purchase of Outboard Motors and Boats	..	..	..	..	..	1,245.65
26. Purchase of Special Equipment	..	..	..	..	..	1,037.09
TOTAL EXPENDITURE						\$119,488.21

Colonial Development and Welfare Schemes:

D.201B (u)	Tour Director of Agriculture in West Indies	\$	787.75
D.981, E-F	Completion of Central Farm		15,644.96
D.1108 (249-251: 166)	Training of Farm Demonstrators and Assistant Agricultural Officer		1,029.30
D.1236	Livestock Officer		4,746.37
D.1366	Minor Economic Schemes (Cultivation of Pineapple)		631.61
D.1807	Staff for Agricultural Department		25,470.64
D.1808	Agricultural Education		26,764.64
D.1819	Scatter Plot Trials, etc.		8,494.14
D.1824	District Agricultural Stations		25,306.52
D.1868	Land Clearing Scheme		57,578.28
D.1876	Special Crop Investigations		900.60
D.1914	Livestock Scheme		42,305.35
R473A and D1807A	Experimental Officer		4,675.83
TOTAL C.D. & W. SCHEMES ..			\$214,333.98

REVENUE

<i>Head 4:</i>	Subhead	8	Sale of Government Stores	\$134.61
	„	13	Receipts from Central Farm	1,110.29
	„	14	Sales of Produce and Plants, etc., Ag. Sta's.	3,441.47
	„	28	Fees for Veterinary Officer's Services ..	4.00
TOTAL REVENUE ..				\$4,690.37
D.1868	Land Clearing Scheme			\$1,570.55
TOTAL REVENUE FROM C.D. & W. SCHEME				\$1,570.55

APPENDIX VIII.

LOCAL WEIGHTS AND MEASURES

1 quartia= $\frac{1}{2}$ almud= $2\frac{1}{2}$ quarts
 1 almud=5 quarts
 1 benequen=15 quarts
 1 shushack=4 almuds=20 quarts
 1 cargo=60 quarts=12 almuds

1 barrel=110 quarts

300 ears of corn in husk=60 hands
 1 hand=5 ears, i.e. the number picked up in each hand when counting ears
 60 hands=300 ears=(should shell out to) 1 cargo.

1 block chicle=1 pesada=1 arroba=25 lbs.
 4 pesadas or 4 arrobas=100 lbs.=1 quintal.

1 mecate 1 task—25 yards x 25 yards—approx. one-eighth acre
 16 mecates=1 manzana=approx. 2 acres
 (8 $\frac{1}{2}$ varas plus 1 machete length=1 mecate).

1 cart-load firewood=300 sticks at 3ft. long.

1 fathom=6 feet=1 brassada
 ("Brassada" is literally the distance between outstretched arms (*brassos*)).

CITRUS—

A unit of grapefruit is a 70lb. box
 A unit of oranges is a 90lb. box
 A/2 juice carton contains 24x12oz. tins
 A/10 juice carton contains 6 tins approx. 1 gall. each
 404 juice carton contains 12x24oz. tins
 Barrels contain 43 gallons
 4 British Honduras Dollars equal £1 Sterling.

